HISTORY OF
THE DISCOVERY AND EXPLORATION
OF CHINESE TURKESTAN

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HISTORY OF THE DISCOVERY AND EXPLORATION OF CHINESE TURKESTAN

by

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FOREWORD

This work proposes to review the development of geographical knowledge of Chinese Turkestan as shown in the efforts of the men whose travel and study in the area contributed to our present knowledge.

The term Chinese Turkestan as used here refers to that province of the late Chinese Empire which was formally established in 1881 as Sin-kiang and which encompassed the basin of the Tarim River, the Takla-makan Desert, and its drainage, also Chuguchak and Dzungaria, located north of the Tien Shan Mountains. The basin of the Tarim is easily delimited by the watershed, and the political boundaries very nearly coincide with it in the south, where it joins Tibet, in the west where it touches Afghanistan and borders Russian territory, and in the east where it borders the Provinces of Tsing-Hai and Kansu. To the north the Chuguchak area follows the watershed in the east along the Baituk Bogdo and Nomen Mingin Gobi, but in the west the political boundary disregards this feature and cuts across the Emel River, the Ili, the Tekes, and the Aksu. Thus only about one eighth of the area drains out of the province, the rest draining into its own interior. At times, especially in the earlier period, the name *Gobi* was improperly applied to this area. The Gobi area lies east of the provincial boundaries. In the early 19th century the term *High Asia* seemed to apply to this area plus Tibet. The term dropped out of use in English by the middle of the century, but in German and French it persisted to the end of the century. This term was even used as the title of a work by Grenard, and it still appears at times in the present century. Still earlier, in the 18th century, the area was often called *Chinese Tartary* or even *High Tartary*, but by the middle of the 19th century these terms had become rare. The term Central Asia covers more than this area; it comprehends all the Turkestan area from the Caspian Sea to the Province of Kansu and at times Tibet. Again, the term *Turkestan* includes Russian Turkestan, all the way to the Caspian, but omitting Tibet. From the beginning of the 20th century this term has become more common in Europe, but the area discussed here has to be

qualified by the term *Chinese* to exclude the Russian states. In some maps of the middle 19th century the term *Kashgaria* covered the whole area east to Lob Nor, but this usage was never general. The spelling of the term *Turkestan/Turkistan* has also varied, but it now seems to have been standardized as *Turkestan.*

Place names, as spelled by the several writers, presents a continuing problem. In the present work when a name can be clearly identified as one that appears in *Webster's Geographical Dictionary*, the spelling in that work has usually been followed. Otherwise the spelling of the source reference is retained. The transliteration of names from Russian, when clearly identified, follows the spelling of *Webster's Biographical Dictionary*. When based on a German transliteration, the *w* has usually been changed to *v* and the *y* to *i*. When place names cannot be identified with a modern term, the spelling of the publication in which the name appears has been retained. Thus, in some cases, names have been changed or identified differently since the publication of the source.

The source of statements and discussions in periodicals, where there is a formal author and title, are mostly given in brief form in a footnote. These clues should make it easy to locate the publication in the Bibliography. If all essential bibliographical data appear in the footnote, and if the item only appears once, then it is omitted from the Bibliography. When the reference is made to editorial comment or news items from the journals, only the name, volume, year, and page of the publication are given.

Certain long titles of periodicals are used in abbreviated form. For a list of the abbreviations, see the Bibliography.

The inaccessibility of some items in the extensive bibliography have made it necessary to use reports and reviews. Some works have been completely unavailable. When references are based on data from works not personally examined by the writer, significant items have been marked with the asterisk.

The nature of this study and the abundance of material on other aspects of the subject have made it necessary to avoid discussion of such related fields as the ethnology of the area, its linguistics, and its political history, except as required for explaining individual ventures.

The present writer is indebted to the Library of the University of Texas and the Library of A. & M. College of Texas for the use of their books and for aid in obtaining books not on their shelves. Thanks are also due Dr. D. D. Brand of the University of Texas for encouraging the initiation of this work, and to Dr. Edward C. Breitenkamp of Texas A. & M. College for reading the manuscript and for his useful suggestions. Preparation of the maps used as illustrations was made possible by support from the Fund for Organized Research, A. & M. College.

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I – TRAVEL IN CHINESE TURKESTAN FROM ANCIENT TIMES TO 1800

In pre-Christian times Europeans knew little of this area, although there is some evidence of travel. Nor were the Chinese well acquainted with it. Before the beginning of the Christian Era the Chinese Empire had a fluctuating control west of modern Kan-su Province. Its primary concern lay in keeping the western tribes outside the Great Wall. The Turkestan area contained several independent tribal kingdoms organized around the capital cities – Kashgar, Yarkand, Khotan, and others north of the Takla-Makan. Alexander the Great actually approached the Kashgar area and brought it under his control for a short time. Then his army marched down into China along a route that two thousand years later seemed almost impassible for muletrains and caravans.[1] During the time of the Seluccid kings Greek knowledge of the area seems to have continued to exist, for Strabo knew something of the area, and the Ptolemy geographers showed some reasonably accurate information.[2]

The first individual we know of by name to have entered the area was the Chinese Emperor Mu-Wang, who, as a tourist and for the pleasure of seeing far places, travelled between 985–980 B.C. to the Kuku-nor area on the eastern edge of the region discussed here.[3]

There probably never was a complete break in contact between Europe or the Levant, and China. The land routes almost inevitably led through the Turkestan. Particularly to be noted are the three historical routes: The Silk Road, which led via Cherchen, Khotan, Yarkand, Kashgar, and on west, the Tien Shan Nan Lu along the north edge of the Takla-Makan, and the North Road from Hami to Karakol, Urumchi, Manas, Chuguchak, and then to the Russian areas. The only other routes generally available were by sea.[4] A north-south

[1] Baker, J. N. L., *A History of Geographical Discovery and Exploration*, p. 25; also Sir Percy Sykes, *History of Exploration*, p. 17.
[2] Sykes, *History of Exploration*, 37.
[3] Hennig, *Terrae incognitae*, I, 23–27.
[4] Lattimore, *Inner Asian Frontiers of China*, 173; Rev. Alex Williamson, Paper read to the Philosophical Society of Glasgow. – *Nature* 31 (April 2, 1885) 516.

route led from modern Semipalatinsk to Kuldja, Muzart, Aksu, Khotan, Leh, and into India, but it does not seem to have an importance comparable to the east-west routes.[5] It was along the east-west route between 138 and 126 B.C. that the first Chinese embassy, under Chang K'ien, brought back the first news and geographical information about Central Asia, where he had gone to open commercial relations.[6]

During the first century A.D. under the leadership of General Pan Chao, who led campaigns past Kashgar and into areas near the Caspian,[7] the Chinese Empire extended its control to include Chinese Turkestan and secured the routes for commerce. Pan Chao may even have tried to open negotiations with the Romans, who had then become his neighbors. At any rate a Chinese ambassador reached Antioch via the Silk Road route in 97 A.D.[8]

Records of the Roman Empire indicate that trade goods from China reached Italy in the first centuries of the Christian Era,[9] but contact between the two empires remained extremely tenuous because between them lay the Parthian lands, and the Parthians acted as intermediaries rather than furnishing routes of passage.[10] Buddhist pilgrims visiting shrines in India often used the Silk Road to the vicinity of modern Yarkand, where they turned south to approach India from the north, by-passing Tibet. The first of these pilgrims was the monk Tao-ngan, who made the trip in 316 A.D. He wrote an account of his trip, the *Hsi-yu-chi*, which described the western lands and included maps and sketches, but all of which is now lost.[11] His return and report led to a diplomatic mission from King Kapila in 425, which opened friendly

[5] Rawlinson, Address, in *PRGS* 11 (1867) 165.

[6] Barthold, *La découverte de l'Asie*, 77; Hennig, *Terrae incognitae*, I, 252–270.

[7] *Nature* 70 (July 14, 1904) 275–276.

[8] Cary and Warmington, *The Ancient Explorers*, 161.

[9] Sykes, *History of Exploration*, 22–23; also C. Raymond Beazley, *The Dawn of Modern Geography*, I, 180; Cary and E. H. Warmington, *The Ancient Explorers*, p. 161; Bury, *History of the Later Roman Empire*, II, 330–331. If an envoy from the Roman Empire really was sent to China in A.D. 166, which seems doubtful, he evidently passed through India and came up through Annam, not through the Turkestan. – Hennig, *Terrae incognitae*, I, 434–441.

[10] Barthold, *La découverte* . . . , 77; V. Grigoriev, *Turkestan Oriental*, 266–272; F. Hirth, *China and the Roman Orient*, 300.

[11] Hennig, *Terrae incognitae*, II, 30. This is evidently the Shi-tao'an listed in the *Encyclopaedia Britannica*, 11th Edition (New York, The Encyclopaedia Britannica Company), 1910, XIII, 845. Another early monk listed in *idem* is Fa-hien, who travelled to India in 399 and returned by sea in 414. – See Fa-hien, *Fo-kwo-ki (Memoires on the Buddha Realms)*, translated to French by Abbé Rémusat and Landresse, whence translated to English by S. Beale and again by Laidlay; also Sam Beale, *Travels of Fah-hian and Sung-yan, Buddhist Pilgrims* . . . , 1869.

relations between the two countries, evidently again via the Turkestan route. Then other priests took up the pilgrimage to India: Hoi-sun in the 6th century, Song-yun in 518, Hsuan-Tsang 629–645, Fa-yung[12] in 420, Dharma Krama in 453, I-tsing 671–695, and Wu-kung 751–754. Of these I-tsing travelled by sea, and he does not enter this account. After the travellers listed, other monks often came, mostly via the Turkestan routes, and they became a familiar sight in Indian temples.

Of these monks Hsuan-Tsang wrote the most enlightening account and has become the best known. After some years of teaching as a Buddhist religious, he decided to attempt the trip to the home of his religion, despite imperial orders against leaving the national boundaries. He set out across the Gobi Desert and reached Hami; thence, after great hardships, he went on to the south slopes of the Tien Shan Mountains and on west out of Chinese Turkestan. After travels through the Talas Valley, Tashkent, Samarkand, and the Upper Oxus, where he met the tribe of the White Hephthalites or White Huns (Iranians), he passed on south and into India. On his return after several years of study and travel, he passed the Pamirs into Kashgar, Khotan, Lob Nor, and then travelled on across the desert to his home again with 657 sacred Buddhist books and 150 holy relics. His travels had taken fifteen years. He was well received and even ordered to write an account of his adventures and observations. This book, the *Ta-t'ang-si-yu-ki* (*Memoir on Western Countries issued by the T'ang Dynasty*) gives an account of his journey.[13]

During these same centuries Nestorian missionaries established posts across Central Asia, and their religion was regarded as an acceptable

[12] Listed by Hennig but not by Barthold.

[13] Jean Pierre Abel Rémusat (Translator), *Fo-koue-ki*, with additions by Klaproth and Landresse (Paris, 1836); Hiouen Thsang, *Mémoires sur les contrées occidentales* . . . , 2 vols. (Paris, 1857–1858); Stanislaus Julien (Translator), *Histoire de la vie de Hiouen Thsang* . . . (Paris, 1853 (1851?)); William Anderson, "Attempt to Identify Some of the Places mentioned in the Itinerary of Hiuan Thsang," in *JASB*, 16 (1847), Pt. 2, p. 1183; Alex Cunningham, "Verification of the Itinerary of Hwan Thsang," in *JASB*, 17 (1848), Pt. 1, p. 476; H. Yule, "Notes on Hwen Thsang's Account of the Principalities of Tokharestan," in *JRAS*, n.s. 6 (18??), p. 82; Cordier, *Histoire générale de la Chine*, I, 560–566; Stanislaus Julien, *Histoire de la vie de Hiouen-Thsang et de ses voyages dans l'Inde, depuis l'an 629 jusqu'en 645* (Paris (Imp. impériale), 1853); Barthold, *La découverte*, 79; Beazley, *op. cit.*, I, 505; Hennig, *Terrae incognitae*, II, 32, 25–32, 80–90; J. Legge, *A Record of Buddhistic Kingdoms, Being an Account by the Chinese Monk Fa-hien* . . . (Oxford, 1886), review by I. P. Minaiev, in *Zapiski* . . . , II, 310–317*; E. Chavannes, [Translation of Hoi-sun and Song-yun] in *BEFEO*, 3 (1903), 379–441.

doctrine in China itself in 638 A.D.[14] As late as the 14th century there were twenty-five metropolitan bishops in Asia for the Nestorian faith. One of these was for the Turkestan itself.[15] At least a part of their routes of access lay along the Silk Road, and the maintenance of the missions shows continued, not intermittent, contact. The existence of the Manichaean cult in Mongolia as well as in Turkestan also supports the evidence for the continued contact with the Middle East. This communication continued to exist later than the Nestorian period, perhaps into the 9th century or until the establishment of Moslem rule.

Although names are lacking, the travel of individuals from Persia is well known. Manichaeism began to reach China in 558, and in 621 there was a temple in Ch'ang Ngan and a separate government official charged with Manichaean activities. The interposition of Buddhist India and Siam, where little or no headway was made by these missionaries, obviously implies considerable travel along the Silk Road. In 631 Ho-lou, a Persian religious, reached China; but his affiliation is not clear. He may have been an adherent of Mazdaism. In 694 another Persian religious reached China, and a Manichaean astronomer arrived in 719. Persian Manichaeans reached and converted at least some of the Uighur tribe about 763, bringing along the Syriac writing system. In 768 the Uighurs allowed the establishment of a Manichaean temple at Orkhon. In 771 the establishment of other temples was proposed. The Uighurs were defeated in 840, driven from Mongolia, and forced into Chinese Turkestan and Kan-su. There they set up other Manichaean temples. Three years later the Manichaeans were outlawed in China, their temples and books burned, and seventy priests executed. By this time the adherents were probably mostly of local origin, and travel to Persia was minimal.[16]

In 747 Tibetans had started a series of agressive attacks against the cities of Chinese Turkestan and had even captured several important places, and the fear arose that by continuing their campaigns to the west, the Tibetans might link up with the Moslems in Iran and enter

[14] Beazley, *op. cit.*, I, 215; Bury, *op. cit.*, II, 331–332; A. C. Moule, *Christians in China before 1550* (London, 1930); Olschi, *The Myth of Felt*, 18.

[15] For the others, by title only, see Cordier, *Histoire générale de la Chine*, II, 384; O. Y. Saeki, *The Nestorian Documents and Relics in China* (Tokyo, 1927), 427 ff.*; P. Pelliot, "Chrétiens d'Asie Centrale et d'Extrême Orient," in *T'oung Pao*, 15 (1914), 629*; Olschki, *Guillaume Boucher*, 15; G. P. Badger, *The Nestorians and Their Rituals*, 2 vols. (London, 1852).*

[16] Cordier, *Histoire générale*, I, 498–501; Barthold, *Histoire des Turcs d'Asie Centrale*, 38–46.

into an alliance. Therefore the Korean-born general Kao-sien-tschi was sent with a large army to cut off the Tibetans. He reached Kashgar by following the North Road and set up a series of military posts near modern Tashkurgan and south into the Pamirs. Another section of the army went as far into India as Gilgit.[17]

Yazdigird III, the last Sassanian King of Persia, facing the threat of Moslem invasion, called on Chinese Emperor Kao-tsong for aid. The emperor refused, but after the death of Yazdigird he did accept Prince Firuz as a refugee and even acknowledged him as King of Persia. By what route Firuz entered China is not clear, but evidently it was through the Turkestan area. The failure to aid Yazdigird laid Western China open to Moslem encroachment, and Moslem embassies entered the empire along this same route as early as 655.[18]

After the Moslem victories in 751 that wrested the Turkestan from Chinese control, the empire's knowledge of the area withered. When land travel continued between China and the Middle East, it either went without record or else it is recorded in Arabic annals not generally available. Maritime contact did continue, but it passed into Moslem hands.[19]

About 845 Caliph Wathik-Billah, influenced by a dream and legends of Gog and Magog and the Great Wall shutting the Turkestan off from the West, sent an envoy Sallam to investigate the wall and to make a report. Sallam led a party of fifty men and took a purse of five thousand dinars, aside from salaries. They travelled apparently through Samarkand and then along the Tien Shan Nan Lu via Aksu, Kucha, and Hami. After being well received, they returned by approximately the same route after an absence of some two and a half years.[20]

Another exception proving that communication did exist is the rare geographical report of Ibn Khordad Bey, an official who summarized the Moslem conquests in 880 A.D. This report is mostly a list of names and legendary accounts.[21]

About 966 A.D. Prince Satook Kookra Khan of the Kashgar area embraced the Moslem religion. His Uighur followers imitated his example. This conversion of the Turkic-speaking tribes was of immense importance to future developments in Western China. By 1757

[17] Hennig, *Terrae incognitae*, II, 116–126.

[18] *Nature*, 70 (July 14, 1904), 275–276.

[19] Barthold, *La découverte . . .*, 79.

[20] Hennig, *Terrae incognitae*, II, 169–185.

[21] Beazley, *op. cit.*, I, 425–427.

Moslems made up the great mass of the population from Tibet to Tarbagatai and east into Yunnan and Szechwan.[22]

In 1081 an envoy from the West reached the Chinese capital, but his route is not known; the envoy may very well have come by sea. The fact of his passage over routes controlled by Moslems indicates that he may have come from a Turkish capital in Asia Minor.[23]

The Mongol conquest by Genghis Khan and his successors united all of Central Asia under one sovereignty; and, despite their excesses, the Mongol rulers took a liberal attitude toward religion, national allegiance, and social customs, and travel again became possible.[24] Therefore in the 13th century Chinese travellers again penetrated to the west. Specific names begin to appear in 1219, when Ye-lü-ch'u-ts'ai, Minister of Genghis Khan, accompanied his master across Turkestan to the west.[25]

In 1220 an envoy of the Emperor of North China travelled through the area to Persia and the Hindu Kush to meet Genghis Khan.[26]

In 1221 a Taoist monk, K'iu-ch'ang-ch'un travelled across China to Uliassutai, the Altai, to Bish-balik, Urumchi, and the Tien Shan Nan Lu, Ili, Talas, and on to the Hindu Kush, ending his travels in 1224.[27]

In 1259 a messenger, Ch'ang-Te, was dispatched to Hulagu, then near Baghdad. He seems to have followed the same route taken by the monk in 1221.[28]

In the years 1260–1263 Ye-lü-hi-liang crossed the Dzungarian area while accompanying the royal court.[29]

Most of these travellers left accounts of their journeys, and their accounts contain priceless data on the history and geography of the

[22] "Western China," in *Edinburgh Review*, 127 (April, 1868), 375.
[23] Barthold, *La découverte*, 80.
[24] Powers, "The Opening of the Land Routes to Cathay," 127.
[25] Bretschneider, *Medieval Researches*, I, 6, 9, 24. Space prohibits a discussion of the campaigns of the Mongols, beginning with Genghis Khan and continuing through the breakup of the empire and the establishment of the Kashgarian Khans and movement of the Turkish tribes. While these movements meant much travel in Chinese Turkestan, the results were military victory or defeat that contributed little if anything to our knowledge of the geography of the area. For a more thorough discussion see W. Barthold, *Histoire des Turcs d'Asie Centrale*, which makes extensive use of nearly synchronous historical manuscripts by Gardîzi, Mahmoud al-Kashgari, and the anonymous "Toumanski" manuscript (discovered in Bokhara in 1892).
[26] *Ibid.*, I, 6, 9–24.
[27] *Ibid.*, I, 7, 35–108; Hennig, *Terrae incognitae*, III, 3–10.
[28] Bretschneider, *Medieval Researches*, I, 7, 109–111, 122–156.
[29] *Ibid.*, I, 157–163.

region visited. Much of this has been published, especially by Bretschneider in his *Medieval Researches*.

During the Mongol domination most Russian princes and grand-dukes had to undertake the journey of submission to Karakorum for their investiture. Prince Yaroslav and Alexander Nevsky are known to have crossed the Tarbagatai area for this purpose. In 1246 Yaroslav died in Mongolia during his return trip. Most of these individuals evidently followed the North Road, though details and names are not available.[30]

After the Mongol campaigns in Eastern and Central Europe a large number of European prisoners were carried off as slaves to Mongol capitals, primarily Karakorum; and there they suffered a variety of fates. Skilled artisans enjoyed relatively kind treatment. William of Rubrouck remarked upon the presence and activities of such individuals as Paquette of Metz, a "Ruthenian" artisan, Basil (son of an Englishman), and the Frenchman Guillaume Boucher.[31] The path by which these European captives reached Karakorum was probably a northern route, by-passing Chinese Turkestan; but because of the large amount of travel then going on, the chance remains that at least some came via the Turkestan. Unfortunately they had little opportunity to leave a record of their experiences.

Plano Carpini, a Franciscan acting as the representative of Pope Innocent IV, journeyed in 1246 via Lake Zaisan from the Tarbagatai to Karakorum, the capital of the Mongol Khans.[32] Benedict of Poland accompanied him, but the latter's writings were far less valuable than those of Carpini.

Not satisfied with the results of earlier expeditions, the Pope tried again in 1253, when he sent another Franciscan, Guillaume Rubruquis (Rubrouck), to investigate rumors that Prince Sartak, the son of Batu, was a Christian.[33] Rubruquis passed through Constantinople, where King Baldwin also gave him a letter of introduction. He found the rumors false, and to gain favor for missionary work, he found he had to continue to Karakorum. His companions on the trip were Brother Bartolo Maus of Cremona, a cleric Gossel, a slave Nicolas, and an

[30] *Ibid.*, I, 5.
[31] Olschki, *Guillaume Boucher*, 1–2.
[32] Beazley, *Dawn of Modern Geography*, II, 280–284; Bretschneider, *Medieval Researches*, I, 5; Hennig, *Terrae incognitae*, III, 24–37; Carpini, *Texts . . .*; Carpini, *Historia Mongalorum**; Olschki, *The Myth of Felt*, 10–12.
[33] Bretschneider, *Medieval Researches*, I, 5; Hennig, *Terrae incognitae*, III, 47–60; Rockhill, *The Journey of William of Rubruck*.

interpreter Abdullah. He remained in Karakorum six months. One of the places that he visited in this area was the Mongol camp of Möngke Khan along the North Road. His report was of real consequence because he identified the Seres of ancient Ptolemean note with the modern Chinese, identified the Caspian Sea as an inland sea, not a gulf, and described life among the Nestorian Christians.[34] He also tried to put an end to legends of a Prester John power in Central Asia.[35]

King John Hayton (Haiton or Haithon) of Armenia made his journey of submission to the Khan in 1254 along the line of the Tien Shan Mountains;[36] returning after a sojourn of several years in the Mongolian courts, via Dzungaria, Talas, Otrar, Samarkand, and Bokhara. By his journey and his submission he had saved his kingdom from invasion.

In 1260 Nicolo and Matteo Polo took advantage of the Mongols' relaxed attitude toward trade to travel through Bokhara to China, evidently along the Silk Road to Khanbalik. Three years later they returned the same way with a request from the Emperor for some Western theologians. When preparations had been made, about 1271, they set out again with two religious and with the young Marco Polo, a boy of seventeen. This time they took a more southern route, through Balkh, the Pamirs, then up to the Silk Road again, arriving in China after three years en route. In 1291 the Polo family decided to return and were entrusted with the care of a princess intended for the Mongol

[34] Barthold, *La découverte*, 91.

[35] F. Zarncke, "Der Priester Johannes," in *Abhandlungen der Phil.-hist. Klasse der Kgl. Sächsischen Akademie der Wissenschaften*, 1879; Olschki, "Der Presbyter Johannes," in *Historische Zeitschrift* (1931).

[36] Bretschneider, *Medieval Researches*, I, 5, 164, 172; Beazley, *Dawn of Modern Geography*, II, 384–386; Hennig, *Terrae incognitae*, III, 61–64. His suite included the Priest Basil, James the Abbot, and Kirakos Gandsaketsi, the latter of whom was the reporter and who wrote an account of the journey. This account in the Armenian language came to light in 1616 in a Georgian monastery. Prince Argutinsky translated and published it in *Sibirski Vestnik* (1822), pp. 62 ff.* Klaproth translated the Russian text to French in *Nouveau Journal Asiatique*, 12 (1833), 273 ff.* Bresset made a new translation from Armenian directly to French in *Mémoires de l'Académie des Sciences de St. Petersburg* (1870)*. A new translation by Patkanov appeared in 1874 – see Beazley, *Dawn of Modern Geography*, II, 381–391; Cordier, *Histoire générale*, II, 409–410; *Encyclopaedia Britannica* 11th Ed., vol. 13, pp. 114–115. Another account was apparently "dictated" to a "French Secretary" Nicholas Faucon in Poitiers, in 1307 – Olschki, *The Myth of Felt*, 22–23; "La flor des Estoires de la Terre d'Orient," in *Recueil des Histoires des Croisades*, Documents Arméniens, II (Paris), 1906, 111–253; Klaproth, in *JA*, 2nd Ser., 12 (1832), 273 ff.*; E. du Laurier, "Les mongols d'après les historiens arméniens," in *ibid.*, 5th Ser., Vol. 11, 431 ff., 463 ff.*

king of Persia. This time they travelled by water and so beyond the range of this study. Fortunately Marco had learned both the spoken and written language and became well versed in the culture in which he lived, and he left an account of his travels that surpasses all his contemporaries in supplying geographic knowledge of Central Asia and China.[37]

From the time of Marco Polo on, however, many indications show that the road remained open. Indeed, in 1340 Francesco Balducci Pegolotti wrote a commercial handbook containing two chapters of advice for merchants travelling to China. While he only mentioned the place names Tana (Azov), Sarai, Volga, Astrakhan, Organj, Koncheu, and on east, and while he did not mention cities in the Turkestan, his recommended route evidently lay in this area.[38]

Merchants left little record of their journeys, however extensive they may have been. For the written record the two best sources are the missionaries and political emissaries, both representing literate groups whose duties required written reports and accounts. The adventures of Marco Polo, however, serve to remind us that when the merchant class elected to leave a written account, it had a story to tell equal in interest and information to that of diplomats and missionaries. There is documentary evidence of travellers who crossed this area, and in some cases they left records that add to the geographical knowledge of the area along their routes.

The Franciscan John of Montecorvino in 1288, at the age of 35, departed Europe with letters from Pope Nicolas IV for the Great Khan. He reached Tabriz and remained there a long time before returning in 1289. Shortly thereafter he set out again and soon wrote a letter, whose date is disputed, telling of his sojourn in the capital of Kublai Khan. He passed through India after apparently reaching it by sea. With him went Peter of Localongo, a Franciscan Brother Arnold of Cologne, and a Lombardian surgeon, whose identity has been suggested as Johannes Vitodoranus (Johannes von Winterthur).

From China Johannes wrote several letters whose dates are in question. They centered about the year 1306 and were delivered by a postal system through Central Asia that took about one year to deliver them in Rome. The letter of *circa* 1306 was carried by the Monk Thomas of Tolentino, evidently via the Turkestan route. In answer

[37] Barthold, *La découverte*, 93–94; Hennig, *Terrae incognitae*, III, 88–108; E. Powers, "The Opening of the Land Routes to Cathay."

[38] Yule, "Notices of Cathay," in *JRGS*, 10 (1866), 270–278.

Pope Clement IV named Johannes Montecorvino Archbishop and sent nine newly appointed bishops to his aid. The fact that three of them died en route testifies to the difficulty of the route which probably led through the Turkestan. One of them, Bishop Andreas of Perugia, wrote accounts of their experiences. After the death of Archbishop Johannes Montecorvino the mission languished.[39]

In the 14th century Rashid-ad-din in collaboration with several other scholars wrote a large work on world history, *Jami'-al-Tavarikh*, and added thereto a geographical supplement, which unfortunately has been lost.[40]

About 1325 the Franciscan Friar Odoric of Pordenone (1280–1331) (Odorico Matthiussi di Pordenone) travelled to Pe-king by the sea route, remained there three years, and returned by land, crossing Tibet and Badakshan, perhaps crossing the south-west corner of the Turkestan.[41] Back in Padua he dictated his memoirs to a fellow monk at the instigation of his superior, William of Solagna. Unfortunately the task was not complete at the time of Odoric's early death at the age of 44, in 1331. His report was printed first in 1513 in Odoricus, *De rebus incognitis* (Pesaro, 1513).[42]

Brother André Longjumel (Longjumeau), serving the efforts of Louis of France and Pope Innocent IV to reach an understanding on the status of Christians and to encourage the establishment of missions, passed along the Lake Zaisan route to Karakorum in 1249.[43] Leaving Lyons in 1245, he passed through Aleppo, Mosul, Persia, Talas, and went on to Karakorum. His mission failed because he arrived after the death of Khan Guyuk and during the reign of his widow. She regarded the mission as an act of submission on the part of France and demanded tribute to seal the bargain. By 1251 Brother André was back in Caesarae in Louis' court. He wrote no report, and our scanty knowledge of his journey comes from accounts recorded at second hand by Vincentius Bellovacensis, a fellow of his order.[44]

[39] Hennig, *Terrae incognitae*, III, 133–160, 199–204. The travels of Sir John Mandeville are of too doubtful authenticity to be considered here.
[40] Barthold, *La découverte*, 80; Rashid-ed-din, *Histoire des Mongols de la Perse* (translated by M. Quatremère) (Paris, 1839).
[41] Yule, "Notices of Cathay," 273–274; *Odoric de Pordenone de Venise à Pékin au moyen âge* (*Séries des beaux voyages d'autrefois*) (Paris (Pierre Téqui), n.d.), 2nd ed.
[42] Hennig, *Terrae incognitae*, III, 191–198.
[43] Beazley, *Dawn of Modern Geography*, II, 372–375; Hennig, *Terrae incognitae*, III, 38–46.
[44] Cordier, *Histoire générale*, II, 395–398.

Francesco Balducci Pegolotti of Florence led a trading expedition across Asia, evidently through the Turkestan, between 1327–1335. He later wrote an *Itinerary* of sixty-three chapters.[45]

In 1338 an embassy from the Khan reached Pope Benedict XII in Avignon. The group was led by an individual named the Frank Andreas, possibly Andreas von Perugia, Bishop of Zaitun. In return the Pope in conjunction with King Robert of Sicily, decided to send a new representative. The Florentine Friar John Marignolli undertook the mission. Leaving Avignon in 1338, his outbound trip, which lasted three years, led via Constantinople, Kaffa, Tana, and evidently followed the Northern Route. He returned via India, only to be employed later on in the writing of Bohemian history. Fortunately for us, he managed to add his memoirs of Eastern Asia to those chronicles. Marignolli was perhaps the last European to pass over the route during the Medieval period. The Mongol Empire began to break up soon after this trip, and travel became so hazardous that it languished.[46]

After the middle of the 14th century travellers became more rare if we judge from written records, and even local production of records is discouragingly scanty.[47]

In 1419 the Shah Rukh, Emperor of Persia, tried to reopen the broken communications by sending an embassy to China, which was then in reduced boundaries, recovering from the long period of foreign domination. The embassy consisted of Shadi Khwaja, Prince Mirza Bay Sangar, Sultan Ahmed, and a painter Khoja Ghayath-ud-din. Leaving Herat in December, 1419, they passed Balkh, Samarkand, Tashkent, Sairam, reached the Tien Shan, and evidently followed the Tien Shan Nan Lu on to Turfan, Hami, Su-chow, and Lan-chow, and reached their goal in December. They spent slightly over one year on the way. They remained in Pe-king five months and started back in May, 1421, by crossing the Pamirs, evidently along the Silk Road to the vicinity of Kashgar. They reached Herat again September 1, 1422.[48]

Another example of local production of records is that of Mirza

[45] Hennig, *Terrae incognitae*, III, 217–226.
[46] Yule, "Notices of Cathay", 272, 274; Hennig, *Terrae incognitae*, III, 231–247.
[47] Ibn Batuta (Abu Abdulla Mahommad) evidently missed this area when he travelled from Khorasan to Kebul, Sind, and Delhi about 1326 – Yule, "Notices of Cathay", 276; see the 19th-century translation of Ibn Batuta into English by Professor Lee of Cambridge.
[48] Hennig, *Terrae incognitae*, IV, 27–32.

Haïdar, a prince of the royal family of Kashgar, contemporary of Indian Emperor Baber. Toward the end of his life, about 1543, Mirza wrote *Tarikh-i-Rashidi*, a description of Eastern Turkestan, which contains a great deal of precise information. The manuscript fortunately survived, and in the 19th century the president of the Royal Geographical Society of Great Britain urged Sir Henry Rawlinson to make a translation of the manuscript; but this was long delayed, and only a partial translation of the work was finally published by R. B. Shaw in 1876.[49]

In 1603 Benedict Goës received a call to carry on his missionary labors in Cathay, and he followed the route Lahore to Kabul, where he joined a caravan that travelled the Silk Road; in November, 1603, he reached Yarkand, whence the next year he went on by the northern route to Kashgar, Aksu, Kucha, Karashahr, Turfan, Hami, and reached Su-chow in 1605. He wrote an account of his trip, but in 1607 he died before finishing it. Fortunately a companion, Isaac the Armenian, kept it for posterity.[50]

After another surprisingly long period, Fëdor Tsakovich, Envoy of Tsar Aleksei Fëdorovich, in 1654 travelled past Lake Zaisan and the upper course of the Black Irtysh, crossed the whole of Dzungaria to the Chinese Wall at Khukhu Khoto, then proceeded to Pe-king. He reported his trip in Spasake's *Sibirskii Vestnik*.[51] This mission intended to negotiate a commercial treaty; however, the envoys had no chance to speak to the Emperor because they refused to execute the ko-tow in his presence. A second embassy, in 1675, resulted in the same impasse. Thereafter the consolidation of territorial possessions brought both governments together more frequently, but primarily east of the Turkestan. There was armed conflict in 1684 along the Amur, but a treaty in 1692 provided for peace and for commerce.[52]

[49] Shaw, "Mirza on the Geography . . . ," in *JRGS*, 40 (1876), 298. A fuller account was later published by E. Denison Ross. See also *PRGS*, 14 (1870), 213; 20 (1876), 482–493.

[50] Barthold, *La découverte*, 113–114.

[51] Golubev, *Short Sketch . . .*, 366.

[52] Lansdell, *Through Siberia*, I, 323–324. The trade never amounted to over a million pounds sterling a year. One reason for the weak activity was the time involved in transportation. From St. Petersburg to Pe-king it required about one year, and the same for return. Therefore trade was confined to long-term transactions. The trade mostly involved tea. In 1820 about 27,000 chests of tea travelled across from Kiakhta to St. Petersburg. The Russians confined the trade to their citizens. The Chinese were less cautious. English goods were rare and were mostly contraband. Some Prussian goods appeared in Kiakhta – *JVAG*, 21 (1824), 124–126.

During the Amur fight the Chinese took several prisoners in the Turkestan areas, both Chinese and Russian. During the prisoners' captivity and subsequent residence in Peking, Russian priests were allowed to visit and minister to their spiritual needs. The priests were also able to interrogate the prisoners and thus gained considerable geographical information about Central Asia.[53]

In 1653 another envoy, S. I. Boisov travelled as far as the Zaisan Lake Tokizilbash.[54]

In 1661 the Jesuit fathers Albert Dorville and Johann Gruber travelled from China proper through Lhasa to India, but evidently they missed the Turkestan area.[55]

In 1678 Galdan Khan, leader of the Arat tribes of Dzungaria, invaded the southern slopes of the Tien Shan, captured and removed the Khan of Kashgar, and set up a puppet government by the Turkic Tribe called White Mountain. The latter remained in control until the Chinese drove them west into Kokand. From this new area they menaced the Tarim Basin with efforts to re-establish their power.[56]

Father Desideri in 1676 travelled to Pe-king from Kashmir and Ladak; but since he passed through Lhasa also, he evidently missed Chinese Turkestan.[57] Since these missionaries represent Modern Europe and were the first to make the trip and record their experiences in forms developed by Western science, they introduced a new era of exploration and discovery, which gave paramount attention not to the act of travelling but to reporting on the results in mutually agreed-upon terms for dissemination through the learned and literate world.

The Jesuits in Pe-king gradually came to impress the Emperor with their dependability and technical knowledge. In 1708 he commissioned Fathers Bouvet, Regis, and Jartoux to prepare a map of the Great Chinese Wall. He was so impressed with the results that in 1709 he asked them to do a map of Liaotung Peninsula and of Manchuria. He then saw the usefulness of maps of all provinces and in 1710 ordered

[53] *Ibid.*, I, 349. For their report: "Works of the Members of the Russian Spiritual Mission in Peking" (In Russian) (St. Petersburg, 1852–1857), in three volumes. Review in *PM* [4] (1857), 3; German translation: *Arbeiten der Kaiserlischen-Russischen Gesandschaft zu Peking . . .*, by Karl Abel and F. A. Mecklenburg (Berlin (F. Heinicke), 1858).

[54] Semeonov, "Dzungaria and the Celestial Mountains."

[55] Ritter, *Die Erdkunde von Asien*, II, 453.

[56] "Western China," in *Edinburgh Review*, 167 (1868), 387.

[57] Ritter, *Die Erdkunde von Asien*, II, 453, quoting Melchid Thevenot, *Voyage à la Chine des P. P. J. Gruber et D'Orville* in *Relat[ions] de divers voyages curieux*, New Ed. (Paris, fol. 1696), II, 1–2.*

them prepared, particularly in the area of Sakhalin-Ula, Tsitsihar, and the Russian border. In eleven years the handful of fathers had mapped an area far larger than Europe. Of the two copies made, one remained with the Emperor, and the other was sent to the King of France as a gift. It remained in the King's private library in Versailles until the beginning of the French Revolution.[58] It formed the basis of d'Anville's map of China, but in the translation many errors crept in that were incorporated into subsequent maps.

Under circumstances that are not yet clear, a Russian, Madatov, early in the 18th century started a journey from Semipalatinsk and travelled south, actually reaching India via Issyk-Kul and the Tien Shan Mountains.[59] This feat was not repeated for over a hundred years.

In 1719 Captain Urusov and Ensign Somov received orders from Emperor Peter I to go on an expedition to Yarkand and to explore the gold-producing regions. They surveyed the shores of Lake Zaisan and the banks of the Irtysh, but it is not clear whether they really reached Yarkand.[60]

In 1720 General Likharev with 440 soldiers set out to search for the source of the Upper Irtysh, and he encountered an army of 20,000 Kalmucks guarding the northeast frontier of Dzungaria against the Chinese. After peaceful negotiations with this new army he proceeded on his mission, but we know nothing of the rest of his discoveries.[61]

In 1722–1723 a Russian artillery captain prepared a map of the Dzungaria area, based on information furnished by the Kalmuck Count Khung-Taidschi, who exercised control over the area.[62]

Also in 1722 the Chinese Emperor, feeling offended by the Russians, expelled all the Moscow traders, and trade stopped. The Treaty of

[58] Ritter, *Erdkunde*, II, 470. This is not to say that Chinese cartographers were unavailable. Indeed, as early as 1311–1312 Chu-sze-pun compiled a large atlas of the Chinese Empire, entitled *Kwang-yu-tu*, which went through several editions. As early as 1615 Sir George Thomas Staunton presented a copy to the Royal Asiatic Society, where it received the title *Extensive Maps and Drawings in four volumes*. This copy evidently furnished the basis for the *Novus Atlas Sinensis* by Jesuit missionary Martini (Amsterdam, 1655). D'Anville (*Mémoire sur la Chine*) gave credit for a high degree of accuracy to this work. However, these maps do not otherwise enter the present discussion because they represented primarily the Chinese Empire before the Turkestan area was effectively incorporated – W. Huttmann, *JRGS*, 14 (1849), 117–118.

[59] Semeonov, "Dzungaria and the Celestial Mountains."

[60] A. Abramof, "The Lake Nor-Zaisan and Its Neighborhood," in *JRGS*, 35 (1865), 58–69.

[61] *Ibid.*

[62] Ritter, *Erdkunde*, I, 416.

Kiakhta in 1728 provided for limited trade at two border towns, Kiakhta and Tsuru Khaitu. Kiakhta then became a trading center and the channel for trade and travel, by-passing the Turkestan area.[63]

In 1737 the Russians advanced their political lines past Orenburg and came into conflict with Galdan-Cheren, the ruler of Dzungaria. One of his lieutenants, Amursana, called on the Chinese for help, and in 1755 two Chinese armies reached the area and set up their own administrative organization at Yara and Amursana, but heavy winter snowfall, deep summer mud, and an endemic eye disease caused them to move their headquarters south to Chuguchak.[64] In 1755 the Emperor Ch'ien-lung renamed the city Tarbagatai-Khoto, "The City of the Tarbagatai"; in 1767 it was changed to Sou-tsing-tsching.[65] Later the province was called Sy-yu, and the capital moved back to Ili.[66] Here the capital served for both Little Bokhara and Dzungaria well into the 19th century, and at the same time served as a place of exile for Chinese criminals. In the meantime Governor Neployej of Orenburg had annexed the area down to and including the north bank of Nor Zaisan. Since this line was untenable, Russian control was soon extended south to include the lake.[67] In 1757 all of Dzungaria came under Chinese rule, and in 1758 this expansion also firmly fixed the Chinese hold on the Tarim Basin.[68]

The occupation of Zaisan by the Russians jeopardized the traditional attendance of the Chinese at the warm mineral springs at Makrana and at the nearby Buddhist temple, and this health resort was deserted.[69]

This movement by the Russians also supported private trips, and a few years later a miner named Snegireb moved about the Altai and Chuguchak in search of gold.[70] Evidently he found little.

The Russians used the next few years to consolidate their advance

[63] Lansdell, *Through Siberia*, I, 324–325; review of Meadows, *The Chinese and Their Rebellions* in "British Relations with China," in *Edinburgh Review*, 105 (April, 1857), 517–551, especially p. 536.

[64] Ritter, *Erdkunde*, I, 419.

[65] *Ibid.*

[66] Davis, "Notices of Western Tartary," in *Transactions of the Royal Asiatic Society*, II, Part 1, 197–201. Ili is also spelled Ele, Chinese Hwuy-yuen-ching – W. Huttmann, "On Chinese and European Maps of China," in *JRAS*, 14 (1844), 119.

[67] Abramof, "The Lake Nor-Zaisan and Its Neighborhood," in *JRGS*, 35 (1865), 58–59.

[68] "Western China," in *Edinburg Review*, 167 (April, 1868), 387.

[69] Abramof, "Lake Nor-Zaisan and Its Neighbourhood," in *JRGS*, 35 (1865), 58–59.

[70] Semeonov, "Djungaria and the Celestial Mountains."

into Siberia and the great Northeast territories and advanced little to the south. The English were only gradually gaining a foothold in northern India, and the principal geographical activity was performed by the Chinese. In the first years after the inclusion of the Chuguchak area in the Chinese Empire, it and the Tarim Basin were temporarily included in the enormous Shensi Province, which proved too unwieldly; after 1764 the Province of Kansu was created to reduce the size of Shensi and later Sinkiang to include the loosely held lands in the west. Thus the Chinese Empire, which in the first century A.D. had extended to the Caspian and had shrunk to China Proper after the fall of the Mongol Empire, had reasserted its control over the Turkestan sufficiently to come into contact with the Russian territorial lines.[71]

At this time Emperor K'ang-hsi had his empire surveyed by two Jesuit mathematicians at his court, Fathers Spighan (Spigahu) and Rocha, between 1750 and 1760, and had their map engraved in the Chinese and Manchu languages – China Proper in Chinese; Chinese Tartary, Tibet, and Korea being in the Manchu. A copy of this map reportedly is preserved in the East India Company's Library in London, which also contains a MS Italian translation of some of the sheets, in which the coasts are shown. This map was the basis of D'Anville's "Atlas de la Chine".[72]

After the publication of K'ang-hsi's survey the Chinese Empire completed the conquest of Kalmuck Tartary (Eastern Chuguchak) and Little Bokhara (North of Kashgar) in 1760 and extended the boundary to the west. Emperor Ch'ien-lung in 1761 ordered a new edition of the map, to consist of 100 sheets. Soon thereafter, he ordered a new survey, in which the new area was to be included, made by Fathers Hallerstein, Espinka (Espinha?), and D'Arrocha between 1768 and 1773. These maps correctly located many places badly placed on the earlier K'ang-hsi's map. This newer map was evidently the basis of Klaproth's four-sheet map of Central Asia, published in Paris, 1836, though it failed to show that Kan-su extended west to include Barkul, Urumchi, and other western towns.[73] Biot's map was also evidently based on this survey.[74]

[71] Murchison, "Address," in *PRGS*, 14 (1870), 318–319.
[72] Huttmann, "On Chinese and European Maps of China," in *JRAS*, 14 (1844), 117–127; Mason, *Great Figures . . .*, 167, provides for earlier maps by Chinese Lamas 1705–1717 as the basis.
[73] *Ibid.* In 1782 the map was re-done on a larger scale to provide for all of the 19 provinces and 496 districts with their multitude of local names.
[74] *Ibid.*

Emperor Ch'ien-lung also in 1763 ordered the publication of a work entitled *Se-yu-tung-wan-che,* a hexaglot geographical dictionary of Dzungaria, Eastern Turkestan, and Tibet, translating names into Chinese, Manchu, Mongol, Kalmuck, Tibetan, and "Turkestan" languages and characters.[75]

In all of the later seacoast surveys, when the results were compared with the work of the Jesuit mathematicians, the accuracy of the latter was laudable. In the interior Kashgar was known also to European observations, and when checked again, it also showed close correlation with the positions assigned by the Jesuits.[76] D'Arocha and Hallerstein in particular determined several astronomical points in Dzungaria, Little Bokhara, and Hangor-Ozen (later Konur Ulen), but there is no evidence that they visited the Tien Shan itself.[77]

An anonymous geographer, presumably Chinese, travelled over the Empire during the '70's and wrote an account which he hoped would correct erroneous ideas about the geography of the area. He found no trouble in the travel, and indeed many routes were found open to places unfrequented by travellers since the "beginning of the world." On Mount Foussi (?) in 1777 he wrote his account of his knowledge of the empire's geography, entitled *Dsan-vun-si-you-Long.* This account was first translated into the Manchu language, then into Russian and German by Dr. Rehmann, physician to the Emperor of Russia. Dr. Rehmann published the account in the *Ephémérides géographiques* in Weimar. This account was then translated into French by D. Friéville.[78] The account takes up individual provinces and gives a brief description of many of the cities, towns, and smaller districts. For example, it included in the Province of Dzungaria the areas of Ili, Ourmtzi (Urumchi?), Hami, Pidchan, Turfan, Halchar (Karashahr?), Kucha, Aksu, Uchi, Yarkand, Hotaen. The indirect means of reaching the West meant several transliterations, and the names in many cases

[75] *Ibid.* Other early maps: "Atlas of China Proper," in East India Company Library, described by Huttmann in *Asiatic Journal*, December, 1822*; a 11-foot × 8-foot broadsheet by Li-yang-hu in 1832, of which a copy was sent to the Royal Library in Paris in 1843 and which was described by Biot in *JA* (4th Ser., I), 279; "A General Map of the Ta-tsing Empire," by Le-ming-che, in 1825.* One copy was brought from China by Plowden, one of the directors of the East India Company, for inspection by the Royal Geographical Society. It had one general and 40 special maps, including four of the province of Ele (Ili), meaning Dzungaria and Eastern Turkestan.
[76] Huttmann, "On Chinese and European Maps of China."
[77] Golubev, "Brief Sketch," p. 366.
[78] "Géographie chinoise," in *JVAG*, 1 (1818), 105–142.

cannot be identified. He mentioned the defense of *Goutchin* by Manchu warriors in 1755, the depopulation of Urumchi, the large garrison at Huan-chou in 1765, deportation of criminals to Tongaeu, the river system in the north. While he mentioned no names, he noted the regular yearly travel through the Turkestan of all Moslem princes from this area to the Pe-king court to make their submission to the Empire, except for the Ghasaks, who only had to make the trip once each three years. He recalled the flight of Prince Tze-ben-dordsi from Russia in 1771 to the Tarbagatai, where he took up residence. He noted the "Tartar" population of Turfan, Karachar, Kurle, *Bougour*, Aksu, Baït-chinn, Yarkand, Bolor, Gohan, Tai-mourchi, and a few others.

The Tarbagatai area, or Chuguchak, was studied about this time by a Tartar mullah, Sa-fuilla-kazi, who reported his findings to Kasin-bek, a Persian professor at Kazan. These notices helped fill in the blanks for this area, although the mullah reported two lakes, Ala-kul and Ala-Tugul, which later turned out to be one – Ala-kul.[79] In 1786 the area about Chuguchak was controlled by a Kirghiz tribe whose leader exacted toll from caravans that came along the route from Semipalatinsk.[80]

Near the end of the century the attention of the Russians again turned to the Turkestan area, and in 1793 a Russian botanist, Sievers, advanced to the Tarbagatai, but it was forty years before another explorer got so far. K. A. Meyer in 1826 only reached the Arkat Mountains, Chingiz-tan, and Karkara. Humboldt in 1828 did not quite reach Dzungaria, but went only as far as Bati on the Irtysh, a Chinese outpost. However, Humboldt did diligently collect the itineraries of many Asiatic traders who had visited Asia in caravans and of some of the trips recorded in Chinese sources.[81]

At the close of the 18th century a Sergeant Ephraimoff, a Russian imprisoned for some time by the Uzbeks, escaped from them and passed through Yarkand and published his travels in Europe on his return.[82] Another Russian, Pansher, prepared a map of Central Turkestan, but it is not available.[83]

[79] Ritter, *Erdkunde*, I, 415. The etymology of Tarbagatai is given as a reference to the *Tarbaga* or marmots which abounded in the area.
[80] *Ibid.*
[81] Golubev, "Brief Sketch," p. 366.
[82] Hayward, "Journey from Leh . . . ," in *JRAS*, 40 (1870), 82.
[83] Ritter, *Erdkunde*, I, 421.

Few of the travellers in Chinese Turkestan left works behind that were scientifically acceptable, although they must be used for lack of others. With the opening of the 19th century, more of the travellers were scientists or had scientific training. At first their energies were to be taken up mostly with tracing the outlines of the terrain features, political boundaries, and locating the cities. Not until the end of the century were they to begin looking under the surface.

II – THE RECONNAISSANCE PERIOD: 1800 TO THE TREATY OF PE-KING

The first years of the 19th century were not very productive of geographical knowledge. The first notice is that of Putinsev, a Russian interpreter, who in 1811 visited Kuldja and Chuguchak and published a report in the *Sibirskii Vestnik*, which was later used by Klaproth and Ritter for their *Geography*.[1] Putinsev visited the warm springs of Dzungaria in 1811,[2] then continued south to discover the watershed between the north and south slopes of the Tien Shan. From the hot springs he returned to Siberia with his report.

In 1821 a Russian merchant, Bubeninov started out from Semipalatinsk and actually reached Kashgar. How he returned is not known.[3]

By 1820 the English position in Central India had also been consolidated; and military, political, and commercial representatives who had pushed their way into northern India were ready to extend their influence. One of the first developmental projects was the preparation of adequate maps of India. Thus they began the Great Trigonometrical Survey of India, which required a careful exploration of the enormous Indian land mass. This survey allowed the collection of accurate information on the absolute elevation of topographical features.

William Moorcroft was an English merchant connected with the East India Company and represented the adventurous type that helped push the Empire into Central Asia. After serving as veterinary surgeon to the Bengal Government, he travelled widely in India, reported on a careful examination of Lake Manasuwara (Manasarowar?) and even entered the Province of Ladakh, which in 1820 was still considered part of Tibet. It and Badakshan were sometimes called Little Tibet. He resided for some time in its capital, Leh. From there, with the idea of opening up trade with Central Asia, he planned to push the interests of the Company to Bokhara. In this endeavor he operated extensively from Leh, interviewing native travellers, pilgrims, and merchants. He

[1] Semeonoff, "Dzungaria and the Celestial Mountains."
[2] Ritter, *Erdkunde*, I, 416, 418.
[3] Semeonoff, "Dzungaria and the Celestial Mountains."

was also a horse fancier, and much of his travel was undertaken for the collection of studs to improve existing equine stocks.[4] In 1819 he prepared for what was to be his farthest and final trip. He proposed to pass through Tibet Proper to Yarkand and then to Bokhara, but he encountered delays and frustrations because of the jealousy of Kashmir merchants and the refusal of Chinese authorities to honor his passport.[5]

After further delays at Kashmir and difficulties with the ruling Rajah, he left for Kabul in 1824 with a servant Mir Izzutallah (Izzet Ullah), who had earlier served Elphinstone. When Moorcroft failed to return, rumors spread that he had died in Bokhara. An investigation then showed that he was murdered at Anghob in the province of Ladakh. His death was evidently politically inspired by representatives of the Chinese Empire, who feared the possible results of his explorations.[6]

Moorcroft left behind a great many papers; and when Captain Archer of the British Army, examined them, he found an extensive report on Chinese Turkestan. For Moorcroft the term Khotan (Khoten) meant the central area of the Takla-Makan, not the city itself, whose existence he doubted. However, he gave considerable detailed information about the other towns, their population, distances between towns, the weather, ethnography, and economics, the river systems, and the mineral wealth.[7] His servant and helper, Mir-Izzet-Ullah, who accompanied him on these travels, wrote his own account of the area. This account was later published.[8]

In 1824 a traveler, evidently German, left a record of travel between Ladakh and Aksu. However, the name left on the manuscript could not be completely read. The account was found fifty years later in

[4] Moorcroft, "On the Purik Sheep of Ladakh and Some Other Animals," in *Transactions of the Royal Asiatic Society of Great Britain*, I, Part 1, 49–55; "Notice sur le Voyage de M. William Moorcraft au lac Manasarowar, dans la province d'Un-dés, au Petit-Thibet," in *JVAG*, 2 (1822), 51–58, based on *Asiatic Researches* (Calcutta, 1816).* Moorcroft was at this time in charge of the India Company's stud farm at Pusa, Patna – Mason, "Great Figures . . . ," 170.
[5] "Voyage de M. Moorkroft dans la Tartarie," in *JVAG*, 12 (1821), 241–242; 16 (1822), 252–256.
[6] Huc, *High Road in Tartary*, 177. The figure given here of twelve years spent in Lhasa seems impossible.
[7] Moorcroft, "Notice on Khotan," in *JRGS*, 1 (1831), 235–247.
[8] Translated from Hindi by Professor H. Wilson and published in the *Calcutta Oriental Quarterly Magazine* in 1825,* republished by the Royal Asiatic Society – *JRAS*, 28 (1857), clxxxiv.

Omsk and reported to the Geographical Society by Veniukoff.[9]

After Humboldt's return from Mexico in 1804 he hoped to establish the altitude of the snow line and study the geography of plants. This study led him to question the altitude of Central Asia as reported by Marco Polo. During the reign of Alexander I of Russia, Count Romanzov invited the distinguished geographer to accompany him on a mission into Tibet by way of Kashgar and Yarkand, but the War of 1812 caused a postponement of the project until 1829, during which time Humboldt prepared himself by studying the Russian and Chinese languages.

In 1829 the expedition finally set out and covered the Urals, the northern Altai, and proceeded on to the Caspian Sea. Humboldt did not actually reach the parts of Central Asia discussed here, but he gathered enough data to support the three-volume work he wrote later. He only travelled about the edges of Dzungaria, unable to get permission to enter because of the rebellion which had erupted in the area in 1826. He did meet many refugees fleeing punishment for their part in the unsuccessful revolt.[10]

This rebellion was a continuation of the old fight by the White Mountain Khojas to re-establish themselves in the Tarim Basin. In 1827 the latest pretender, Jehanghir Khan Khoja, actually entered Chinese Turkestan and captured Kashgar and Yarkand. After a brief stay he was forced out by a Chinese relief military expedition. The Khoja fled but was delivered over to the Chinese by his inhospitable host, the Khan of Kokand. He was executed in 1828, but his martyrdom only increased his fame, and anti-Chinese feeling was inflamed among the Moslems.[11] Incursions from Kokand were to be renewed in 1852.

In his study of the area Humboldt placed the geographical center of Asia at a point in the Tien Shan near Lake Ayar. He discussed the mountain ranges but not the depressions in the Sin-kiang area, of which he knew nothing, evidently because he had only one astronomically established position in the area to work from: Khotan, reported by several missionaries.[12]

Doubts about the altitude of Central Asia persisted for some years,

[9] Sir Rutherford Alcock, Address, in *PRGS*, 21 (1877), 450.

[10] Ritter, *Erdkunde*, I, 471. For an account of the revolt see Davis, "Notice of Western Tartary," in *Transactions of the Royal Asiatic Society*, II, Part 1 (1828), 197–201.

[11] "Western China," in *Edinburgh Review*, 127 (1868), 388.

[12] Humboldt, *Asie centrale*, 269–281. The names of the missionaries are unknown.

supported by several inductive papers, such as the work of Mr. R. Strachey of the Bengal Engineers, who in 1851 doubted that the mountains about Yarkand and Khotan exceeded an altitude of 3,000 feet.[13] Lieutenant Strachey, a Dr. Thompson, and Captain Cunningham of the Engineers, did some exploring on their own. They started from Simla August 10, 1847 for Yarkand and Khotan.[14] They had been appointed by the Indian Government to form a commission to work with a similar Chinese commission to examine and to fix the boundaries between Tibet and Ladak. When the Chinese commission failed to appear, these men proceeded to spend their time exploring. Lieutenant Strachey followed the course of the Parang River. Cunningham and Dr. Thompson (Thomson, Thomason) continued to Haulé over the Lanak Pass, then on to Leh. Cunningham then turned toward Kashmir, while Thompson went on to Nubra and Karakoram. In this area he gathered a valuable botanical collection and reported on the mountain heights and glaciers.[15] Thus Thompson in 1848 became the first Englishman to cross the Karakoram divide into Chinese Turkestan[16] although Moorcroft had travelled in areas north of it.

On Thompson's return to Bengal the Indian Government appointed Richard Strachey, brother of Henry, to prepare a report on the geography of the northern areas. He confirmed Humboldt's impressions of the low elevation of the Turkestan central area but discounted the reported extreme heights of the mountains.[17] He himself evidently had not been in the Turkestan. In 1866 Dr. Thompson received the Founder's Gold Medal of the Royal Geographical Society for his scientific work.[18]

In spite of the example of Moorcroft and Humboldt, the bulk of exploration continued to rest on the shoulders of the Russians. One Englishman, Gardner, about this time travelled "in a zig-zag fashion" through all the countries between Samarkand and Kashmir, but his records were so confused that little could be made of them.[19] He, however, is an isolated case.

[13] Strachey, "On the Physical Geography . . .," in *JRGS*, 21 (1851), 58.

[14] W. J. Hamilton, Presidential Address, *JRGS*, 18 (1848), liv–lv.

[15] *Ibid.*; *JRGS*, 19 (1849), xlvii, lxvi, lxvii.

[16] Rawlinson, "On the Recent Journey . . ., "*PRGS*, 11 (1866), 7; Mason, "Great Figures of Himalayan Explorations," 171.

[17] Richard Strachey, "On the Physical Geography of the Provinces of Kumáon and Garhwál in the Himalaya Mountains and of the Adjoining Parts of Tibet," in *JRGS*, 21 (1851), 57–85.

[18] *PRGS*, 10 (1866), 178–179; *JRGS*, 50 (1880), 70.

[19] *PRGS*, 10 (1866), 141.

Humboldt's 1828 expedition was the first since the time of Sievers and Meyer to reach the edge of the Tarbagatai.[20]

In 1831 the Russians built a fort on the Ayaguz, a tributary of the Balkash, and two years later an astronomer Fëdorov examined the south shore. In 1840, 1841, and 1842 two engineers, Karelin and Schenk, began a survey of the Semirechensk region, the Ili River, Dzungarian Ala-taú, and Lake Balkash. In 1841 Kovalefski penetrated to Kuldja on a diplomatic mission that resulted in the establishment of friendly relations between Russia and China.

In 1840–1842 Karelin and Alexander Gustav Schenk visited and described Lake Ala-kul, the Ala-taú, and Upper Tentek. They went as far as Chuguchak and the Chu River.[21]

In 1845–1846 two French priests of the Order of St. Vincent, Huc and Gabet, crossed the eastern edge of this area, and their priority entitles them to some attention. On instructions from the Apostolic vicar they undertook a study of the Tartars. Dressing like Tibetans, they left Pe-king with one camel driver, named Samdadchiemba. Hoping to profit from this rare opportunity to investigate the monastery or lamasery of Kumbun, they applied themselves to the study of Tibetan. They were allowed to visit the miraculous trees whose leaves reportedly contain the outlines of letters of the Tibetan syllabary. To their consternation, careful examination of the leaves supported the legend! Passing then along the rocky shores of Koko-nor, they first reported the existence of a rocky island in the lake, an island on which twenty lamas had built a temple where they could spent their time in retirement. There were no boats, and communication with the lamas was possible only in winter, when the water froze over.

From Koko-nor their route led to Buhain-gol, thence across the Tsaidam to the Tang-la Mountains, then on to Tibet and out of the area under discussion here. During their travels the good fathers were concerned with ethnographic descriptions and less with geography. As a result they furnish useful information about the people, and we are surprised at the kindness with which they were treated at the hands of Chinese, Mongols, and Tibetans alike, both Buddhist and Moslem. Unfortunately for us, but fortunately for themselves, they were not geographers nor cartographers. Indeed, they were apprised of the fate

[20] Golubev, "Brief Sketch," 366.

[21] Semeonov, "Djungaria and the Celestial Mountains"; Schrenck, "Reise 1840 in den östlichen Dsungar-Kirgisensteppe," in *Beiträge [zur] Kennt[nis] [des] Russ[ischen] Reich*, 7 (1845), 65 ff.*.

of the Englishman Moorcroft, who was murdered on his way to Ladak. Among his effects were many maps and plans, which had aroused Chinese suspicions, and the two priests avoided possession of such articles.[22]

In 1852 the Durbar of Kokand, supported by the Khojas, the old White Mountain refugees from Kashgar, descendents of Jehangir Khan Khoja, again entered the Tarim Basin in an effort to conquer it. The Chinese repulsed the invasion, and their victory ended the Kokand encroachment until 1857, when another Khoja, Wali Khan Turra, moved in and occupied Kashgar. His ferocity and cruelty resulted in numerous executions. Unfortunately one of the victims was a young Prussian scientist of unusual ability.[23]

In 1855 Fort Vernoë at the northern base of the Trans-Ilian Ala-taú was built by the Russians, and their scientists used it as a base for Explorations into Eastern Dzungaria, the Ili Valley, and the Tien Shan. By 1858 the area about Issyk-kul had been surveyed by Russian Army engineers.

The survey of Central Asia by Russian engineers had one serious drawback. An accurate survey based on sea level at St. Petersburg had been run as far as the Caspian, but then it jumped the Sea to take up in Central Asia. This gap left all figures thereafter less than satisfactory. At the same time an observatory set up at Tashkent served as a base for astronomical measurements, and longitudinal figures derived from that observatory. The Trigonometrical Survey of India, on the other hand, had the advantage of beginning at Sea Level in India.

In 1856 Colonel Khomentofski and General Silverhelm made a reconnaissance of the Issyk-kul Valley, but local hostility made it impractical to penetrate far into the Chinese area. Ensign Yanovski, who reached the deepest part, found the defile of the Zaúkú.[24]

Also in 1856 Semënov set out to explore the area of the Tien Shan, leaving from Fort Vernoë. The first trip was ill-prepared, and he returned for a larger security detachment. Then he ran into a band of Kirghiz and had to withdraw.[25]

In 1857 with the help of Governor General Hasford the Bogu tribe was driven back into Chinese territory, and Semënov passed from

[22] Huc, *High Road in Tartary*; Andree, *Wanderungen*.

[23] "Western China," in *Edinburgh Review*, 127 (1868), 388.

[24] Semeonov, "Dzungaria and the Celestial Mountains." For surveys, see *Encyclopaedia Britannica*, 11th Ed., II, p. 738.

[25] Semeonov, "Dzungaria and the Celestial Mountains."

Issyk-kul to the imposing Zaújú-davan and the sources of the Naryn, even ascending the Tengri-tagh (Khan?). Here he found the sources of the Sari-Jaza and the Naryn-gol or Ergui.[26]

For a long time the Russians had known of the Jesuit survey of Central Asia in the 17th century, through the reports of Zakharof, a diplomat in Pe-king; but of the points astronomically located, only two lay in Russian territory – the mouth of the Kunur-ulan and a point on the Karatal, Kapal District. Therefore, to check these findings and to extend them, the Imperial Geographical Society in 1859 organized a new expedition under Captain Golubev. This expedition, supported by a guard of 100 Cossacks, went as far as Sümbé, Karakara, and the banks of the Tekes. Finally, in August, 1859, it reached Kuldja and Chuguchak.[27]

The 1850's also marked a great increase in activity among the British in India. Although there was no direct correlation between the two nations, England and Russia, both began a stubborn advance on the Chinese Turkestan area, with the blessing of their respective Geographical Societies, which tried to keep abreast of the movements. There was naturally an increase in travel along more beaten paths, such as the Peking-Mongolia-Siberia routes.[28] The spirit of competition between British and Russian geographers over the opportunities in West China was tempered to mutual respect by the enormity of the task. This relationship was openly debated at a meeting of the Royal Geographical Society on May 13, 1867.[29]

The political situation in China at this time made travel difficult. In 1850 a new revolt started against the Emperor in Kwang-si, Hupeh, and Hu-nan Provinces. The rebellion pretended to support the restoration of the Ming Dynasty to replace the unpopular Manchu line. The rebels set up a capital at Nan-king, and the Pe-king government seemed unable to maintain control. In 1857 the British, as a result of the "*Arrow Affair*," carried on military operations about Canton, Taku, and Tientsin. During the later part of these operations they had French aid. They actually entered Pe-king, where a peace treaty was signed in 1860.

The Moslem majorities in Kan-su, Shen-si, and Chinese Turkestan

[26] *Ibid.*

[27] A. Golubeff, "Brief Sketch of the Results of the Issyk-Kul Expedition." in *JRGS*, 31 (1861), 366–370; also P. P. Semënov, "The First Ascent of the Tien Shan," in *JRGS*, 31 (1861), 356–366.

[28] Lansdell (*Through Siberia*, I, 349) lists six Englishmen who followed that route between 1863–1877.

[29] *PRGS*, 11 (1867), 162–166, 203.

took advantage of the sore straits of the Pe-king Government to revolt against the governmental administration.[30] Once they had met with military successes, the chiefs fell out among themselves in the same area. Their efforts to maintain a government were further hampered in the west by a growing stream of Jaxartes and Kokand refugees from Russian Turkestan who fled to the east to avoid the pressure of Russian expansion into their areas.[31]

The most effective leader was Yakub Beg, also called Atalik Ghazi, who in 1864 set himself up in Kashgaria, that is, in nearly all of the Tarim Basin.[32] The virtual independence of the area continued for years. In 1871 the Russians, insisting that they could not permit chaotic conditions on their borders, and fearful of British support for the independence movement, occupied most of Dzungaria, promising that they would return it when China was able to govern it effectively.

After the conclusion of the Tai P'ing Rebellion in the east the Chinese could turn on the Turkestan. With the aid of a large foreign loan the government sent a powerful expedition to recover the area. They gradually succeeded, and by 1877 they had reached the Pamirs. They then claimed the return of the Kuldja or Dzungarian area. By the Treaty of Livadia, September, 1877, nearly all of the province was returned to China.[33]

It is in the light of these facts that the exploration of the years 1850 to 1878 should be considered.

Richard Strachey in 1853 reported that communications between Balti and Yarkand were almost cut off by political troubles as well as natural difficulties. The only intercourse was between Ladakh and Yarkand. Some commerce went on, but it was badly hampered by the high toll exacted by the Maharaja of Kashmir.[34] The direct route Nari-

[30] Wen-Djang Chu, "The Immediate Cause of the Moslem Rebellion in Northwest China in 1862," in *Central Asiatic Journal*, 3 (1958), 309–316.

[31] Rawlinson, "On the Recent Journey . . . ," p. 8; Sherard Osborn, "Notes on Chinese Tartary," in *PRGS*, 11 (1867), 162–163; "Western China," in *Edinburgh Review*, 127 (April, 1868), 380–381; Murchison, Address, *PRGS*, 10 (1866), 235–240; Memoir by Colonel Heinz of the Imperial Geographical Society of St. Petersburg on the "Dungan" Revolt, reported in *PRGS*, 10 (1866), 235; Murchison, Address, in *PRGS*, 12 (1868), 262–264.

[32] For the campaigns by which Yakub Beg came to power, see "Western China," in *Edinburgh Review*, 127 (1868), 389–393.

[33] Meadows, *The Chinese and their Rebellions*; *Encyclopaedia Britannica*, 11th Ed., Vol. 5, pp. 321–322; Walter Goetz, *Propyläen-Weltgeschichte*, Vol. 9, 439–442; Pierce, *Russian Central Asia*, 28–29.

[34] Rawlinson, "On the Recent Journey . . . ," in *PRGS*, 11 (1867), 9.

Khorsum-Khotan was closed entirely, as was the old road Gar to Khotan.[35]

The closing of the routes was effective enough that in 1854 the Abbé Guillet, Krick, and another missionary were murdered at the edge of Indian territory on the route to Lhasa.[36]

Thomas Thom[p]son and Joseph Hooker in *Flora Indica*,* 1855, reported: "The chain of the Kuen Luen where it forms the northern boundary of Western Thibet is as lofty as the Himalaya. Its axis has not been crossed by any European traveller, but has been reached by Dr. Thomson, who visited the Kara-korum pass, elevated 18,300 ft."[37] The next English advance was to breach that obstacle.

In the early fifties three Schlagintweit brothers, Adolph, Hermann, and Robert, Prussian subjects and all with scientific training, were in Indian territory as employees of the East India Company and the British Government. In 1856 they carried on some geographic studies in the Rawalpindi area. In July, 1857 they started on an expedition through Ladakh, hoping to cross into the Turkestan. They crossed the Karakoram, then the Aksai-Chin to the Karakash River, and descended it through the Kun-lun Shan to the Pass at Karangetok. Adolph Schlagintweit there heard news of the Turkish revolt in Kashgar and Yarkand against the Chinese garrisons. The term "Turkish", of course, referred to the Turkic-speaking indigenous population of Kokand and the descendants of the White Mountain tribe of the last century. Schlagintweit pressed on to Yarkand through Kilian and Kargolik (Khargalik, Qarghalik). Then he had to flee with the troops to Kashgar, where the Chinese followed the rebellious troops, and there Adolph was executed by command of the local ruler.[38] Most of his papers were of course lost, but the loss was not complete. One of his maps survived and was taken to India later and presented to a Dr. Leitner.[39]

Adolph's brothers Robert and Hermann, however, made a neat

[35] R. Strachey, "On the Physical Geography of Western Tibet," in *JRGS*, 23 (1853), 6.

[36] *JRGS*, 25 (1855), cxiii.

[37] *JRGS*, 27 (1857), clvii–clviii, quoting Humboldt's discussion of letters of the Schlagintweit Brothers in *Zeitschrift der Allgemeinen Erdkunde* (1856), 532, 551.*

[38] H. Strachey, "Dispatch . . . respecting the Fate of Adolph Schlagintweit," in *JRAS*, 3 (1859), 144–146, 172–174. The name of his murderer is also given as Nulee Khan, a local chieftain whose claim to spiritual leadership depended mostly on his being one of the Khojas of the Moslem area. Nulee Khan did not escape; in 1867 the more powerful Atalik of Yarkand had his throat cut – *PRGS*, 14 (1870), 69.

[39] *PRGS*, 18 (1874), 116.

map of the Himalayas and of the Tien Shan and sent it to Paris. This map showed for the first time the separation of the Kun-lun from the Karakorum Pass, and an elevation of 5,250 meters at Bushia. He also demonstrated that the Kun-lun itself was not a major watershed but that the Yarkand River flowed through it and the desert to join the Tarim.

All in all, the brothers covered 18,000 miles. They brought 1,400 soil samples and a whole herbarium, as well as ethnographical material, and a total of forty-three volumes of field notes![40] According to their geographical measurements the Jesuit figures for the position of Yarkand and Kashgar were ten percent in error.[41] In arriving at these figures, they used the Survey of India, which had reached Leh, and they projected the survey figures and carried the survey across the mountains into the Tarim Valley – truly an epoch-making feat for the first Europeans to cross the route since Madatov, over a century before. Both of the surviving brothers wrote scientific works later to present the results of the trip. Hermann, for example, reported on the location of 94 hot springs in India and Turkestan.[42]

In recognition of their valuable and intrepid work in crossing the Kun-lun, the surviving brothers received from the Tsar the title of Sakünlünski ("He who penetrated the Kun-lun").[43]

In 1887 the Russian Consul in Kashgar, N. F. Petrovski, erected a monument to Adolph Schlagintweit, commemorating his death on August 26, 1857 as a sacrifice to geographical knowledge.[44]

Robert and Hermann, however, had continued to explore the chain of the Kun-lun and reached Eltschi (Eltscha?) in the Province of Khotan. They were the first modern Europeans known to have reached it. The morning they crossed the Karakoram Pass, they met a caravan from Yarkand; and near the salt lake of Kiook-kul they found the hot springs of Panamik and Tchanglung. After leaving Sum-gol, they followed the Karakash River for three days and inspected the great

[40] Murchison, Address, *JRGS*, 28 (1858), clxxxviii. The members of this remarkable family were already well known orologists for their work in the Alps prior to their employment by the East India Company – Murchison, Address, in *JRGS*, 27 (1857), clvii–clviii.

[41] *PM*, 1 (1855), 142; 2 (1856), 104, 272, 376; 3 (1857), 221, 287, 356, 484, 537–538; 6 (1859), 351–352.

[42] *PM*, 9 (1863), 104–105.

[43] Rawlinson, "On the Recent Journey . . . ," in *PRGS*, 11 (1867), 8.

[44] *PM*, 33 (1887), 190. Petrovski's request for permission to erect the monument at the spot where Adolph was killed was not approved; therefore it was erected in the local Russian cemetery – *Nature*, 37 (1887), 64.

stone quarries of Yaschem. They measured several mountain peaks along the Valley of the Nubra with the survey that they had brought up from Agra.

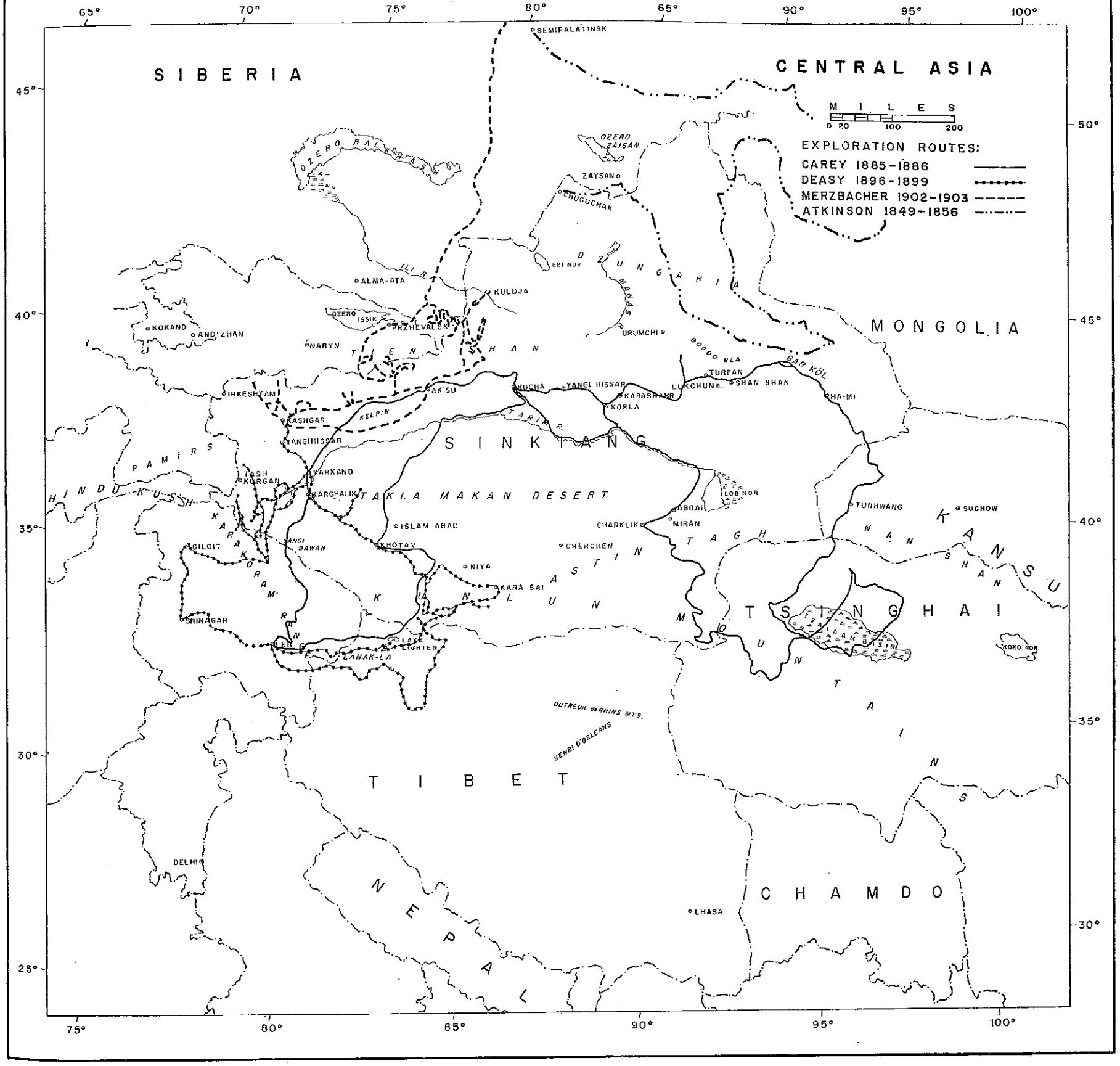
In this outstanding year of 1856 an Englishman also returned from a long sojourn in Russia. Thomas William Atkinson (1799–1862), originally an architect, who had gone to Russia under the patronage of Emperor Nicolas, spent seven years exploring and making water-color paintings of landscapes in Mongolia, the Steppes of the Kirghiz, and Chinese Tartary. Included were views of the snowy Tien Shan.[45] The publication of a book describing his work in Siberia showed that Atkinson had gone further into the Tien Shan than any other scientific traveller,[46] and scientific curiosity was further aroused in Russia.

This same year, 1856, other Russian geographers were also at work. Stchoukine wrote on the geographical and ethnological terminology of Central Asia, Semënov and Wasiljin wrote on volcanoes of the region,[47] and Leopold Schrenck (Schenk) gathered botanical specimens in the Tarbagatai area.[48]

The publication of Atkinson's work further stimulated Semënov to return to the area of the northern Turkestan and continue his exploratory work. The following year he decided to penetrate still further beyond Issyk-kul than before. On this expedition he reached the Karakara, an affluent of the Ili, and the Tiub, and he went on through Little Bukhara to the Kirghiz tribes, who were then at war with the Chinese Government. He continued to the Valley of the Djirgalan and Terek, the Valley of Azoukinsk, the pass of Kash-djar, and the springs of Saridjar (Sari-daria?), the principal source of the Oxus.[49]

In 1858 another expedition under Captain Golubëv started from the Ili River and Lake Balkash to map some of the wild country south and east of that area.[50] The next year Golubëv of the Imperial Staff explored the area between the Tien Shan, the Alataú Chain, the low

[45] Ashburton, Address, in *JRGS*, 32 (1862), cv–cvi.
[46] Atkinson, *Oriental and Western Siberia: A Narrative of Seven Years' Exploration and Adventure in Siberia*; Murchison, Address, in *PRGS*, 27 (1857), cliv.
[47] Murchison, Address, in *JRGS*, 27 (1857), cliv.
[48] *PM*, 3 (1857), 149. The reference to Leopold Schrenck is evidently in error, as well as the date. J. C. Poggendorff, *Biographisch-Literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften* (Leipzig (Barth), 1898), III, 1211–1212, shows Peter Leopold to have been on a voyage around the world 1853–1856, nor does it show any travel in Tarbagatai. The reference must be to his brother Alexander Gustave, and the date to 1840.
[49] Murchison, Address, in *JRGS*, 28 (1858), clxiii–clxiv.
[50] Murchison, Address, in *JRGS*, 29 (1859), clxvi; Golubev, "Brief Sketch," 370.


CENTRAL ASIA
SIBERIA
MONGOLIA
SINKIANG
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NEPAL
CHAMDO
TSINGHAI
KANSU
MILES
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EXPLORATION ROUTES:
CAREY 1885-1886
DEASY 1896-1899
MERZBACHER 1902-1903
ATKINSON 1849-1856
SEMIPALATINSK
OZERO BALKHASH
OZERO ZAISAN
ZAYSAN
CHUGUCHAK
EBI NOR
DZUNGARIA
ILI R.
ALMA-ATA
KULDJA
OZERO ISSIK
PRZHEVALSK
KOKAND
ANDIZHAN
NARYN
TIEN SHAN
URUMCHI
BOGDO ULA
BAR KÖL
TURFAN
LUKCHUN
SHAN SHAN
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PAMIR
HINDU-KUSH
TASH KURGAN
YARKAND
KARGHALIK
TAKLA MAKAN DESERT
LOP NOR
ABDAL
TUNHWANG
SUCHOW
ISLAM ABAD
CHARKLIK
MIRAN
NAN SHAN
KARAKORAM
YANGI DAWAN
KHOTAN
CHERCHEN
GILGIT
NIYA
KARA SAI
ALTYN TAGH
KUN LUN
SRINAGAR
LAKE LIGHTEN
LANAK-LA
KOKO NOR
OUTREUIL de RHINS MTS.
HENRI D'ORLEANS
DELHI
LHASA

valley of Lake Balkash near Semirechni (The Seven Rivers), the Trans-Ilian districts, and the provinces of Ili and Tarbagatai. He went as far as the Buddhist monastery of Sümbé and was the first European to reach it. He established the altitude of some of the mountains about Issyk-kul.[51]

This same year, 1859, Captain Valikhanev, the son of a Kaisek sultan and a native of Central Asia, though educated in the west, took advantage of his knowledge of the language to travel disguised as a Kokand merchant in Kashgar and the province of Nan-lu or Little Bokhara. These experiences were reported in the Journal of the *Russian Imperial Geographical Society*.* He described the atrocities committed by Vali Khan, Khoja of Kashgar, who had allegedly ordered the execution of Adolph Schlagintweit in 1857.[52]

Captain Valikhanef (Valichanov) was in the Turkestan about the same time as the surviving Schlagintweit Brothers, 1858–1859. He reported the results of his travels from the north of Tien Shan to Bolor, south of the mountains, and he then crossed the Gobi, East Turkestan, east Jagatai, to Little Bokhara, or Nan-lu. He described particularly the cities, the walls about them, and their size. He found six Turkestan cities of importance: Kashgar, 16,000 houses, Janysar, 8,000, Yarkand with 3,000 houses, Khotan with 18,000 houses, Aksu with 12,000 houses, and Uch-Turfan with 4 to 6,000 houses. The latter was then famous for its cattle market.[53]

In 1855–1856 the enormous undertaking of the Trigonometrical Survey of India was pushed into the Kashmir Valley by Captain Montgomerie, and by 1859 had even extended to modern Tibet. Captain Godwin-Austin undertook the mapping of the Skardo Valley and the glaciers of the Mustagh Range, including the famous Karakoram Pass. His surveys of several old passages to Yarkand were of invaluable help to later travellers.[54]

The surveys made by the Russian travellers did not always agree. While Golubëv in 1859 travelled to the Tien Shan, the Alatai, Balkash, and the Chinese side of the provinces of Ili and Tarbagatai, his statistical reports did not always agree with those of Semënov. On this

[51] Earl de Grey, Address, in *JRGS*, 30 (1860), clxxx; *PRGS*, 4 (1860), 197.
[52] Ashburton, Address, in *JRGS*, 32 (1862), cxliii; *PRGS*, 6 (1862), 162–164.
[53] *PM*, 10 (1863), 36–37. Reported in the *Zapiski* of the Imperial Geographical Society (translated in *Erman's Archiv*).*
[54] H. H. Godwin-Austin, "On the Glaciers of the Mustakh Range . . . ," in *JRGS*, 34 (1864), 19–56; *PM*, 6 (1860), 78; for the scope of the survey see *PRGS*, 5 (1861), 196.

trip he took some astronomical readings and made other physical observations. His measurements varied greatly from those taken by Semënov; for example, Semënov reported Issyk-kul to be 4,200 meters high; Golubëv found it to be 4,691.[55]

Semënov, a geologist by training, not only explored the Tien Shan but took numerous geographical positions by astronomical measurements; he also made a careful study of the mineral composition of the rocks and corrected an error of Humboldt by ascertaining firsthand that the mountain range was not of volcanic origin.[56] In recognition of his geographical contributions, the Tsar added to Semënov's surname that of Tianshanski.

In his report to the Imperial General Staff Golubëv told of his visit to Kuldja and the monastery at Sümbé. He worked out astronomically positions for Urdschar and Chuguchak and checked against those given by Fëdorov in 1834.[57]

About 1861 Veniukoff published in the *Proceedings* of the Imperial Geographical Society of St. Petersburg some details of Central Asian geography that seemed to differ from those already considered "known". These notes were put into English by Michell in a work *The Russians in Central Asia.* Then, in 1866, Orientalist Khanikov wrote to Sir Roderick Murchison, describing a manuscript in the Topographical Department of the (Russian) Ministry of War and asking for help in identifying the author of the remarkable work. This manuscript bore the title "Travels through Upper Asia from Kashgar, Tashbalyk, Bolor, Badakshan, Vokhan, Kokan, Turkestan to the Kirghiz Steppe, and back to Kashmir, through Samarcand and Yarkand". Internal evidence indicated that the author was German and an agent of the East India Company some fifty years before, and that he had the task of purchasing horses for the British. The language was German, and the signature appeared as Georg Ludwig von –, the last name being erased. The manuscript included forty sketches of the countryside traversed. The contents were given a careful study (in translation) and showed signs of discrepancies that led to the conclusion that the manuscript might be a forgery. The evidence was not conclusive.[58]

[55] *Geographische Mitteilungen* (1858), 351*; *PM*, 6 (1860), 194.

[56] Murchison, Address, in *PRGS*, 11 (1867), 216–217.

[57] *PM*, 7 (1861), 198 (text in the *Vestnik* of the Geographical Society in St. Petersburg, 1860, translated in *Erman's Archiv*, Vol. 20, Heft 1).*

[58] H. C. Rawlinson, "Observations on two Memoirs Recently Published by M. Veniukof of . . . ," in *PRGS*, 10 (1866), 134–153; Murchison, Address, *PRGS*, 10 (1866), 236–237. The full text of the MS is printed in English translation in *PRGS*, 10 (1866), 310–315, with criticism by Lord Strangford, pp. 315–317, with letter of comment by Khanikov, pp. 301–310.

The main reason for doubt was the fact that the account described a journey through portions of the Turkestan which no known traveller had visited, and it was therefore difficult to verify statements made in the account.

According to the anonymous account its author left Srinagar May 8, early in the century, and crossed the Indus two days later. From there he reached Chashgur-Gobi, where the "Bili" language was spoken (the only occurrence of the name). Thence he went to "Luimake", where he saw a non-Indian inscription, then on to the village of Mestopan, to Immer-Umma, on to Kashgar, which he reached on June 11, that is, in 35 days, 25 of them spent travelling. Rawlinson believed a minimum of fifty days were required. From Kashgar the writer sent horses to the East India Company, for which pay was refused; therefore this German writer took his manuscript and talents to the Russian troops in the area. He reported Kashgar to have 15,000 inhabitants, 1,500 houses. This varied greatly from the report of Valikhanov, who placed the size at 60,000 and houses at 16,000. The manuscript also reported the existence of an Armenian colony, which critics considered unlikely. The manuscript also showed a list of thirty astronomical positions but without field notes on how the figures were reached, nor did it report possession of a sextant. Other geographical locations described were Yaman-yar River, Kara-kul Lake, Bolor River, Badakshan (Fyzabad), Vokhan, Tang-la, Terek-chai, Osh, and Marghilan.

Comparison of the alleged traveller's account with that of Abdul Medjid (Majid?) in 1856 seemed to show disagreement. One fellow of the Royal Geographical Society, Crawfurd, who had been in India early in the century, maintained that no "foreigner" had been employed to buy horses; a Lieutenant Harvey did not exist; mention of a volcano in India was pure fiction, and he did not believe rabbits (mentioned in the manuscript) existed in Central Asia, least of all, black rabbits. He concluded that the Ludwig von – manuscript was a fake palmed off on an eager Russian Government.[59]

[59] Rawlinson, "Observations . . . ," in *PRGS*, 10 (1866), 134–153. The existence of this manuscript came to light soon after the death of Adolph Schlagintweit, who was one of the few individuals known to be in the area and capable of writing an accurate geographical account in German, but Adolph did not travel north of Kashgar, and he entered India many years after the account was supposedly written. However, we have no sign that the papers of the murdered brother (with one exception) were recovered, at least by the British.

III – THE RECONNAISSANCE PERIOD: 1860 TO THE TREATY OF LIVADIA

In 1860 a treaty in Pe-king between Russia and China, recognizing Russian aid rendered China in negotiations with France and England, not only transferred to Russia the territory between the Ussuri River and the sea, but in the Turkestan area the treaty fixed the boundary line more exactly than did the old Treaty of Kiakhta in 1728. The line ran from the headwaters of the Yenisei to the Tien Shan south of Issyk-Kul, specifically to the old landmark of Chabin-Dabaga on the frontiers of the Government General of Tomsk and Yeniseisk, southwest from Chabin-Dabaga to Lake Dsai-san, then along the Dzungarian Alataú, crossing the Ili, then following the Tien Shan to Kokand. Thus the Chinese Empire gave the Russian Empire a quit-claim to the Khanates of Western Turkestan, Andijan, Kokand, Bokhara, Tajik, and Samarkand. Thereby the generalized term *Russian Turkestan* became a reality, distinctly separated from Chinese Turkestan.[1]

Taking advantage of the new period of peace, a group of English officers with two Frenchmen started out in February, 1861, intending to go up the Yang-tze, then to follow the return route of Abbé Huc. The expedition was led by Captain Blakiston, accompanied by Dr. Bartonas, a botanist, and Major Sarel as zoölogist. MM. Simon and Dupins represented French interests in the upper river system. The plan did not work. Clearance was not forthcoming, and the expedition settled for an exploration of the upper stretches of the Yang-tze.[2] The Chinese policy of exclusion of foreigners continued to some extent despite

[1] Cordier, *Histoire générale*, IV, 70–73; Lord Ashburton, Address, *JRAS*, 32 (1862), cxli–cxlii. The treaties with France and England, whose background deals primarily with foreign affairs in the eastern part of the Empire, do not enter the present study except for one article (Number 6) of the Treaty of Tientsin, 1858, confirmed in Pe-king in 1860, which deserves mention: It provided for the protection of Christian missionaries and restitution of damages done them. At the same time it provided for the right of Europeans to travel in China. Henceforth we may look for more references to missionary effort in China, west as well as east.

[2] Captain T. W. Blakiston, *Five Months on the Yangtse.*

the treaty and made it difficult in those years for foreigners to get permission to travel in the Empire. Even when travellers had obtained permission in Pe-king, local officials seemed to have created extra difficulties. This trouble did not exist to the same extent in the Turkestan area proper, where a strong independence movement had long smouldered.[3]

In October, 1861 the Russian Minister of Foreign Affairs notified the Imperial Geographical Society that a commission would start in 1862 to trace and mark the boundary line on the east, and he invited geographers to take part.[4] The response to this appeal was most heartening. The Geographical Society grew rapidly and in fifteen years had 1,185 members; 447 of them were members of affiliated provincial societies. The Society received government subsidies, private grants, and dues. In 1875 the governmental subsidy was 15,000 rubles, dues 2,950, and grants 43,000. In turn the Society sponsored expeditions and publication of reports on exploration of the region.[5]

In answer to the Minister's invitation Gustav Radde, who had already done some travelling in East Siberia, and whose name is well-known in the geography of the Caucasus, planned a trip to the Tien Shan. He was principally a naturalist, and he hoped to gather much flora and fauna. He also planned to visit Ak-su and Kashgar. Whether he ever actually made the trip is not clear. However, the geologist Ferdinand Freiherr von Richthofen did take advantage of the Minister's offer to undertake a quick trip of observation from across India to Kashmir, then to Yarkand and Kashgar, returning in 1865, via Siberia.[6]

In 1861 also an envoy from the Khanate of Kokand, which was still relatively independent, came to India with a message for the British. Avoiding areas of political unrest, he came via Badakshan,

[3] *PRGS*, 13 (1869), 184–185; Morrison, Memorandum, in *PRGS*, 12 (1868), 171–172.

[4] Lord Ashburton, Address, in *JRGS*, 32 (1862), cxl–cxlii. The Treaty of Peking also lifted any Chinese objection to Russian conquest of the khanates. The British government apparently offered no outright objection to this expansion – see discussion in *PRGS*, 11 (1867), 163–165. Individuals, of course, were free to express more alarm – Meadows, *The Chinese and Their Rebellions*, 475–483. This Treaty of Pe-king also gave Russia and England the right to establish consulates in Chuguchak, Kuldja, and Kashgar. Since Russian influence in the first two was strong, they set up right away. But it took years to succeed in establishing the consulate in Kashgar – *PRGS*, 11 (1867), 164–165.

[5] Rawlinson, Address, in *PRGS*, 19 (1875), 422–423.

[6] *PM*, 8 (1862), 35–36, 149. For his exploring work Richthofen in 1878 received the Founder's Medal from the Royal Geographical Society – *JRGS*, 50 (1880), 71.

Koner Valley, Bajour, to Peshawar instead of by the direct route via Karakoram. On his return he took the more direct route, Karakoram to Yarkand and west.[7] Thus the Kokand envoy crossed the southwest corner of the area under discussion and reported some observations. This Indian explorer received a reward of a 25-guinea watch from the Royal Geographical Society.[8]

In 1862 B. H. Davies published a report on the trade and resources of the countries on the north boundary of India, but as an economy measure the Appendices were not printed. They included a detailed account of the routes to Yarkand, maps of the survey by British and Russian officers, the recent itineraries of Colonel Walker, the Superintendent of the Trigonometrical Survey, and the first mapping of the route Kileh-Penj to Tashkurghan, by an Indian traveller, Mohammed Amin.[9]

In connection with this survey and as a result of the Schlagintweit tragedy the Government of India forbade enterprising Englishmen to explore in the area.[10] Individual Englishmen therefore sought another plan for reaching the Turkestan with plane table and transit. Captain Montgomerie, head of the Land Survey for West Tibet, thought up the idea of having trained natives do some exploring. He explained it to the Bengal Society, and the latter approved.[11]

In 1863–1864 a native *moonshee*, taught by Captain Montgomerie, Mohammed-i-Hamid, travelled to and surveyed the road from Ladak to Yarkand, doing much of his surveying at night to avoid arousing the suspicions of the Chinese authorities. His measurements were different from those of the Jesuits and from those of Schlagintweit.[12] He returned with the survey, but unfortunately he died immediately on his return. Among his notes was a statement brought from Yarkand to the effect that the Russians had a fort near Lob-Nor and intended to build another. He knew of Ak-su, but the name of the Tarim River

[7] Reported in H. C. Rawlinson, "Observations . . . ," 149, from publication by Major James' "Political Records of the Indian Government."
[8] *PRGS*, 10 (1866), 165, 183, 188.
[9] Murchison, Address, in *JRGS*, 39 (1869), clxxviii; *PRGS*, 15 (1871), 286.
[10] Sir Andrew Waugh, Ex-Surgeon-General of India, in *PRGS*, 10 (1866), 164.
[11] Murchison, Address, in *JRGS*, 36 (1866), clxxi; Sir Rutherford Alcock, Address (Obituary for Montgomerie) in *PRGS*, 22 (1878), 317–320.
[12] *PM*, 9 (1863), 388; *PRGS*, 10 (1866), 162–165. Yarkand, for example, was then given as 38° 19′ 46″ N and 77° 30′ E and the altitude as 4,000 feet. Compare this with the modern figure of 38° 24′ N and 77° 16′ 30″ E – See *Gazetteer No. 5*, U.S. Board of Geographic Names.

was apparently unknown. He did bring the first report of buried cities sometimes uncovered by the shifting desert sand.[13]

In 1865–1866 Captain T. G. Montgomerie continued his efforts, sending three pundits or trained Indian helpers north into Tibet where he was carrying on surveys. The work met with such success that his notes made it possible to fill in many of the gaps in older maps. He obtained the first specific data on gold-mining in Northern Tibet, along with indications that an ancient trade route with "paved" stretches led across Tibet from India to Central Asia, via Lhasa and Khotan (Ilchi). Such a route, if reopened, would help trade greatly since the confiscatory toll taken by the Maharaja of Kashmir discouraged commerce. The pundits were also to be congratulated on the fact that, when they completed the circuit of their surveys, they were only 2½ miles apart.[14] If this location established by the Indian surveyors seems to be in error, remember that they established it by transit and surface survey over some of the world's worst terrain, not by astronomical computation.[15]

As a report Montgomerie was able to present to the Royal Geographical Society 191 sheets of maps made of the area between Nepal and Lhasa.

In 1867 Judge Severtsov at the head of an expedition travelled through the Tien Shan and made a profile of it where it meets with the Tengri-shan, at the valley of the Naryn, and at Paschi and Ak-sai Valley. He passed through Barskoun Pass in October and reached the Kashgar-daria. On his return he crossed the ancient Chinese bridge over the Naryn and by November 11 was back in Tokmak. He brought 300 specimens of stone, 263 bird specimens, and 30 samples of mammalia, including several unfamiliar species.[16]

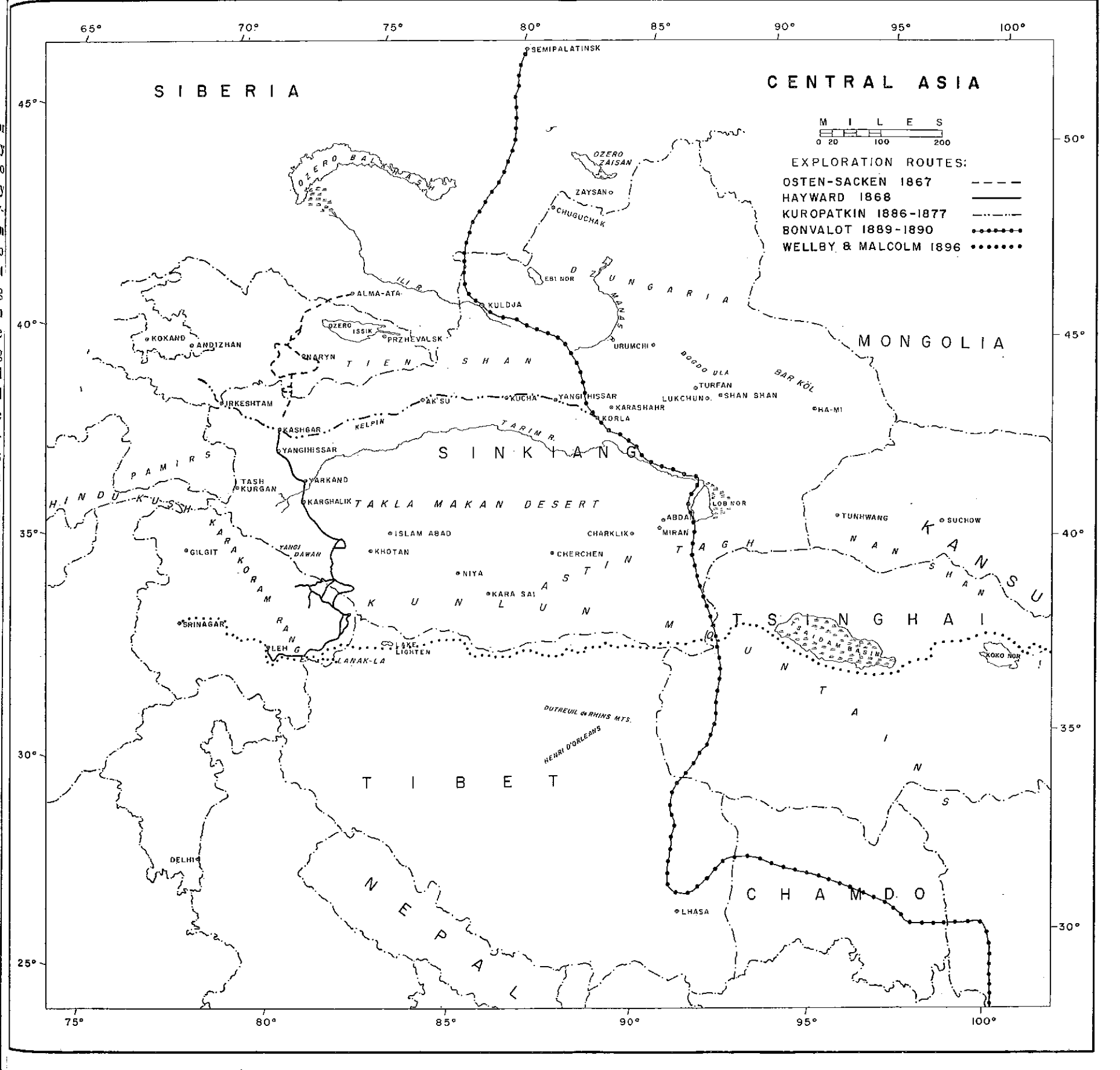
[13] Montgomerie, "On the Geographical Position of Yarkand and Some Other Places in Central Asia," in *JRGS*, 36 (1866), 157–172; Montgomerie, "Report of the Trans-Himalayan Explorations during 1867," in *PRGS*, 13 (1869), 183–198.
[14] This was the Chang-chen-mo Route – Montgomerie, "Report of the Trans-Himalayan Explorations during 1867," in *PRGS*, 13 (1869), 183–196 and discussion, 196–198.
[15] Murchison, Address, in *PRGS*, 10 (1866), 238–239.
[16] *PM*, 14 (1868), 265–266. Severtsof in an earlier expedition to the western Tien Shan had discovered new coalfields, coal formations in the Kara-taù, gold-dust deposits in the Tersa River, and many deposits of iron ore, and he had brought back 2,000 ornithological specimens – N. Severtsof, "A Journey to the Western Portion of the Celestial Range (Thian-Shan) or 'Tsun-kin' of the Ancient Chinese, from the Western limits of the Trans-Ili Region to Tashkend." Translated from *Journal of the Russian Imperial Geographical Society*, 1867, by Robert Michell, in *JRGS*, 40 (1870), 343–419.

On the invitation of Khan Bádshá of Khotan, Habibulla, Surveyor W. H. Johnson of the Indian Survey Department undertook the journey from Leh to Karakash River, where he met an escort that took him to Ilchi (Khotan). He passed along the pass which had been recently discovered by Juma Khan, ambassador of Khotan to the British Government, when the usual road via Sanjú and Karakoram Pass was in the hands of hostile Yarkandis. It turned out that the Khan wanted to hold him as hostage to force the British to send him help in his fight against Yarkand and the Russians who were reported to be advancing toward Yarkand and Khotan. He had only recently become the Khan when he led a revolt which ousted the Chinese. This was early in the Dungan Rebellion, which, for a time, seemed successful in separating Moslem Turkestan from the Chinese Empire. Finally the Khan allowed Johnson to return. While in the area Johnson saw evidence of buried cities, and he even brought back tea found in some of the ruins. He reported an alternate route to Karakoram and Sing-yú, *i.e.* Hindotak-davan and Brindjda-davan and Polú. He made one side trip as far as Keriya. He returned via Sanjú to Shadula (Shahidula). He made a good many surveys with his plane table all during the trip and on its completion could compose a map of the area he had covered. He brought back a great deal of valuable geographical information and was the first European since Schlagintweit to cover that route,[17] and the first to enter Khotan in the 19th century.[18]

In 1867 another expedition sent out by the Imperial Russian Geographical Society under Baron Th. R. Osten-Sacken visited the Tien Shan area. After passing Orenburg, the Urals, and Semi-palatinsk, in June, 1867 Baron Osten-Sacken met Colonel Poltoratski in Vernyi (Vernoë, Wjernoje) to start a reconnaissance and survey of the area that had come under Russian control as a result of the 1860 Treaty of Pe-king, which set the Chinese frontier at the east edge of Lake Issyk-Kul. They departed Vernyi July 2 for Kastek and passed over the Kastek Pass on July 6-7. On July 31 they reached the Chinese border

[17] Johnson, "Report on His Journey . . . ," in *JRGS*, 37 (1867), 1–47; *Science*, 2 (July 27, 1883), 112; Rawlinson, "On the Recent Journey of Mr. W. H. Johnson . . . ," in *PRGS*, 11 (1867), 6–13; Johnson, "Meteorological Observations Taken at Lé," in *PRGS*, 17 (1872), 197–203.

[18] The first since Marco Polo, Benedict Goes, and some Jesuit missionaries of the 18th century "Who were attached to an expedition sent by the Emperor of China to subdue the Eleuths of Zungaria" – Rawlinson, "On the Recent Journey . . . ," 7. For his pioneering work Johnson in 1875 received a gold watch from the Royal Geographical Society – *JRGS*, 50 (1880), 71.


CENTRAL ASIA
SIBERIA
MONGOLIA
SINKIANG
TIBET
MILES
0 20 100 200
EXPLORATION ROUTES:
OSTEN-SACKEN 1867
HAYWARD 1868
KUROPATKIN 1886-1877
BONVALOT 1889-1890
WELLBY & MALCOLM 1896
SEMIPALATINSK
OZERO BALKHASH
OZERO ZAISAN
ZAYSAN
CHUGUCHAK
EBI NOR
DZUNGARIA
ILI R.
ALMA-ATA
KULDJA
OZERO ISSIK
PRZHEVALSK
KOKAND
ANDIZHAN
NARYN
TIEN SHAN
URUMCHI
BOGDO ULA
BAR KÖL
TURFAN
LUKCHUN
SHAN SHAN
HA-MI
JIRKESHTAM
AK SU
KUCHA
YANGIHISSAR
KARASHAHR
KORLA
KASHGAR
KELPIN
TARIM R.
YANGIHISSAR
PAMIR
HINDU KUSH
TASH KURGAN
YARKAND
KARGHALIK
TAKLA MAKAN DESERT
LOB NOR
ABDAL
MIRAN
TUNHWANG
SUCHOW
NAN SHAN
KANSU
ISLAM ABAD
CHARKLIK
GILGIT
YANGI DAWAN
KHOTAN
CHERCHEN
NIYA
KARA SAI
KARAKORAM RANGE
KUNLUN MTS.
TAGHLASTIN
TSINGHAI
SRINAGAR
LEH
LAKE LIGHTEN
LANAK-LA
KOKO NOR
DUTREUIL de RHINS MTS.
HENRI D'ORLEANS
DELHI
NEPAL
CHAMDO
LHASA
65°
70°
75°
80°
85°
90°
95°
100°
45°
40°
35°
30°
25°
50°

at the outpost of Tessik-tash, where Valikhanov met the Chinese in 1858, that is, the watershed of the Western Tien Shan, where the rivers began to flow toward the Tarim. They were then twenty miles from Kashgar.[19] Turning north, they passed through Kopal, The Seven Passes, Chatir-Kul, and Tash-Rabat. On August 8 they reached the old bridge built over the Naryn by the Chinese but later destroyed by the Kokands (100 vërsts west of Kurtka). By their survey they decided that Kashgar was two degrees east of the position given by the Jesuit surveyors. The expedition had lasted seven weeks. The conclusion was not definite because the figures were based on the survey brought by the expedition from Issyk-Kul, and there the base line was based on the astronomically fixed point on the western edge of the lake.[20] These figures also disagreed with the Schlagintweit survey and that of Montgomerie. For his service to geography Baron Osten-Sacken was elected Honorary Corresponding Member of the Royal Geographical Society.

Poltoratski had already explored the great Muzart Glacier in Eastern Tien Shan.[21] Valikhanov had made his way to Kashgar with a trading caravan. Then in 1868 Buniakoffski and Reinthal made barometrical measurements across the Tien Shan Range. Reinthal went as far as Kashgar and by the same type of measurement determined the elevation of Kashgar to be 4,017 feet above sea level.[22]

Shortly before this date George J. W. Hayward retired after long years of military service in India. Not content with a sedentary existence on his return to England, he approached Sir Henry Rawlinson for suggestions. Rawlinson immediately suggested a go at exploration in Central Asia. Hayward took up the idea at once and asked the Royal Geographical Society for equipment and funds. After receiving both, he returned to India to enter this new field.

On September 29, 1868 Hayward started from Leh with a train of Yarkand ponies. He followed the Chang Chenmo route through Kuking, Ku-granj Valley, the hot springs, Chang Lang Pass, Kizil Pass, and the Karakash River, and finally reached Yarkand on December 27. While there he spent some time in a survey of the Yarkand River. He managed an interview with the local ruler and met Robert Shaw, another Englishman who was on a trading expedition at the time but

[19] *PM*, 14 (1868), 266–267, 380–381. Results of the expedition were put into Osten-Sacken's book *Flora Thianshanica – PRGS*, 22 (1878), 341.
[20] Osten-Sacken, "Expedition to the Trans-Naryn Country in 1867," 221–229.
[21] Morgan, "Russian Explorations in Turkestan," 231.
[22] *PRGS*, 14 (1870), 231.

whose itinerary was completely uncoördinated with that of Hayward. February 24, 1869 Hayward travelled on to Kashgar; then on April 13 he started back. He spent another month in Yarkand, then left on May 30, returning via Yangi Pass, which he found much easier than the Sanjú Pass that had previously been considered the normal passageway. His report gave an excellent review of the geography of the area.

Hayward was a trained geographer and understood the significance of what he was doing. He was supplied with surveying instruments by the Royal Geographical Society, and he used them to the best advantage during his advance through the mountains. However, as he approached Yarkand, the desire to avoid exciting the suspicions of the inhabitants caused him to limit his use of instruments to infrequent occasions. While waiting at Shadula, he managed to visit the sources of the Yarkand River and made a conclusive determination of its origin. Later on he located the true course of the Karakash River on the Karakoram slopes.[23] In Yarkand and Kashgar, however, he made repeated sightings and based his figures for those two cities on observations of the sun's meridian. To determine altitudes, the best he had to work with was Casella's Tables for hypsometric measurement based on the boiling point of water. The route that he found along the Chang-chenmo trail to Karakash, Ak-tagh, the Yarkand Valley, and across the Kun-lun Range by the Yangi Pass was revealed as adequate for horse or camel caravans and with some improvements could be made passable for two-wheeled vehicles and guns. Special note is due his use of a small "artificial horizon," invented by a Captain George, which made it possible for him to make some measurements without attracting attention.[24]

From his surveys and notes Hayward was able to draft a map on the scale of one to 16 miles, and later one of 1:8 miles. Unlike Shaw, he did not have a high opinion of trading opportunities in the area because, as he pointed out later, there was a lack of exportable goods.[25]

As a reward for his services to geography the Royal Geographical Society voted Hayward the Gold Medal and a sum of 600 pounds.[26]

[23] Murchison, Address, in *PRGS*, 14 (1870), 316.
[24] Hayward to Murchison, Murree, Punjab, September 11, 1869, in *PRGS*, 14 (1871), 40–41; Hayward, "Journey from Leh . . . ," in *JRGS*, 40 (1870), 33–166; Murchison, Address, in *JRGS*, 40 (1870), ccxvii.
[25] Hayward to Colonel Showers, Murree, April 27, 1870, in *PRGS*, 15 (1871), 14–16.
[26] Hayward to Colonel Showers, May 8, 1870, in *PRGS*, 15 (1871), 16–17; *JRGS*, 50 (1880), 70.

In 1870 he was honored with the Founder's Gold Medal.[27]

On his return to Murree, Hayward prepared for a further trip, this time to study the feasibility of a northern route through the Chitral or Yassin Valley which would be better than that along the Chang-chenmo route.[28] In May Hayward went to Srinagar, where the Maharaja of Kashmir had allegedly been guilty of aggression against his neighbors in violation of the Treaty of 1846 with the British.[29]

Since he planned on the possibility of pushing through the lower Turkestan to Russian territory and then returning to England through Russia, he held up his departure to await word from Russia that General Kaufmann, the Governor General, had received orders to assist him. He then set out for the Pamirs. The Kashmir officials in Gilgit planned to use his presence as an excuse for further aggression; so he returned and waited for a more opportune time. Unfortunately some of his letters describing atrocities by the Kashmir troops in Yassin in 1863 were published in the *Pioneer* newspaper on May 9. They naturally aroused Kashmir feelings against him, and he withdrew all connection with the Royal Geographical Society lest it also become subject to Kashmir displeasure.[30] However, from this point on, the Kashmir government acted properly. Hayward went on to Yassin, where he allegedly engaged in an argument about the hiring of porters. Thus, evidently with the impetus given by Mir Wali, Governor of Yassin, some of the porters besieged him in his tent and attacked him after he had fallen asleep. They dragged him into the nearby woods and stoned him to death.[31]

Robert B. Shaw, a settler in the Kangra Valley for some years, began in the meantime to feel the explorer's itch and, after one trip to the north, decided to venture into the difficult area in the guise of a merchant. While this rôle was in part genuine, he also felt the urge to improve on geographical knowledge. During a trip to Leh in 1868 he met Dr. Cayley, the British Resident at Ladak, who had just returned from an exploration of the Pamir Plateau and the Karakash River. Shaw joined him and met a Yarkand envoy returning from Kashmir. At the invitation of this envoy Shaw undertook the task of

[27] Murchison, Address, in *JRGS*, 40 (1870), cxxviii.
[28] Hayward to Showers, April 27, 1870 in *PRGS*, 15 (1871), 14–16.
[29] Hayward to Showers, Srinagar, May 8, 1870, in *PRGS*, 15 (1871), 16–17; *idem* to *idem*, Kashmir, May 21, 1870, in *ibid.*, pp. 17–18.
[30] Hayward to Murchison, Kashmir, May 21, 1870, in *PRGS*, 15 (1871), 17–18.
[31] Rawlinson, Address, in *PRGS*, 15 (1871), 20–21; Murchison, Address, in *PRGS*, 15 (1871), 285.

crossing to Yarkand. From there he went on to Kashgar via Karakoram, Sooget, San-jú, Kargalik, Yarkand, and Kashgar. While Johnson was the first Englishman to travel in Eastern Turkestan and return to report, Shaw has the distinction of being the second and of being the first to send out a letter from that area.[32]

Shaw used as the occasion for his travels a program of investigating possibilities of trade. He carried along a cargo of Indian tea and sold it at sixteen shillings a pound, while in England it was selling at 2/6. However, the local inhabitants seemed to prefer Chinese tea to the Indian variety.[33]

One of the surprising results of this expedition was the picture drawn of Yarkand as a flourishing city of 100,000 people, active commerce, 60 "colleges", many primary schools, and a great variety of consumers' goods, even ice for cooling sherbets. The enlightened rule of Yakub Beg encouraged public works. The area, then, meant to Shaw a huge outlet for trade goods in cloth and tea, a whole pot of which was considered a normal portion for each man upon rising in the morning.[34]

As a result of Shaw's optimistic report on trade possibilities the Indian Government began to put pressure on the Maharaja of Kashmir to ease the excessive toll on goods passing through his domain.[35]

On his return and while he was preparing his story for publication, Shaw heard that a commission of British officers was preparing a trip to the Turkestan on a friendly visit to Atalik Ghâzi, or Yakub Beg. Shaw immediately wired an offer to join them, and in five days he had an approval for the Forsyth Expedition. At the conclusion of this work, which is separately described, Shaw received the Patron's Medal of the Royal Geographical Society. He later resided in Leh and studied and wrote about geography until his death in 1879. His most famous work was the book *Journey to Kashgar*.[36]

Continuing his attempt to get a survey of an area not easily accessible to Europeans, Major T. G. Montgomerie encouraged and aided a silversmith who had in part a European education but whom he expected to have no trouble travelling in Central Asia. The smith is usually referred to as the Mirza. His mission was to start from Badakshan in 1868 and survey the route through Kashgar to Yarkand and return. He crossed the Hindu Kush via the Hajiguk Pass and passed via Bamian, Khulm, Rostak, and Faizabad, which was the capital of Badakshan on the Kokcha River, and a slave-trade capital. With a recommendation from the ruler he started out on December 24, 1868 and in five days reached Zebak. Leaving Zebak January 1, 1869, he rested again in Punja, went on to Patoor, and after approaching via the Kokand route, he reached the watershed. Here at an elevation of 13,300 feet he found to the west water flowing toward the Aral Sea, while to the east it flowed toward Lob-Nor. The party suffered greatly from the cold here. Following the east slope, they passed Ak-tash, or White stone. When they reached Tash-kurgan, a patrol of the Atalik Ghâzi met them. The Mirza identified himself as a merchant en route to Kashgar. Summoned to the Governor of Sirikul (Sarikol?), he so impressed the latter that the Governor offered, nay, insisted on an escort the rest of the way. On January 27, 1869 he set out via Keen, Fort Karawal, and the Yangi-Hissar River. On February 3 he crossed the Turwaruk River over a wooden bridge.

Along this route the party saw every evidence of cultivated land and roadside shops with a good supply of goods at low prices. Indeed, the road was marked at every *tash* (four and one-half miles) with a pole distance marker. In Kashgar the Mirza was received kindly by the Atalik, though his agents searched all the baggage. The Mirza lived and worked in Kashgar some time, and he learned much about the Atalik's rule. He reported the country at peace, the main weakness being the irregular collection of taxes. Apparently both Hayward and Shaw reached Kashgar during his stay. Despite his lack of funds the Mirza started back as agent of an Afghan who wanted him to deliver money to his family in Kashmir. He brought back a good description of the city of Kashgar. He set out on June 7, 1869 and returned via the Karakoram Pass to Leh, and reached the headquarters of the Trigonometrical Survey after being absent nearly two years.[37] From

[32] T. Douglas Forsyth, "On the Transit of Tea from North-West India to Eastern Turkestan," in *PRGS*, 13 (1869), 198–203, copying letter of Shaw to his sister, dated Sanjú, Turkestan, November 28, 1868; Shaw, *Visits* . . . , 70–71.

[33] *PRGS*, 13 (1869), 202.

[34] Shaw, *Visits* . . . ; Shaw, "A Visit to Yarkand and Kashgar," [Extracts] in *PRGS*, 14 (1870), 124–137.

[35] *PRGS*, 14 (1870), 136.

[36] Markham, "The Fifty Years' Work of the Royal Geographical Society," in *JRGS*, 50 (1880), 70; Rawlinson, Address, in *PRGS*, 16 (1871), 390. One of Shaw's studies was an historical inquiry into the identification of some ancient names of places in the Turkestan – Shaw, "On the Position of Peïn, Charchand, Lob Nor, and other Places in Central Asia," in *PRGS*, 16 (1872), 242–253. . .

[37] Montgomerie, "Report of the Mirza's Exploration of the Route from Caubal to Kashgar," [Extracts] in *PRGS*, 15 (1871), 181–204; *PRGS*, 15 (1871), 286–287. Pundit Munphul was another of the native explorers – *JRAS*, 47 (1877), 20.

his observations and measurements considerable information was added to the existing maps.

In 1870 the Dungans (spelled variously), a Moslem group living on both sides of the Tien Shan, ventured into the southern area, endangering the new kingdom of the Atalik. He therefore led troops to Urumchi and after some fighting made terms by which the Atalik in turn helped the Dunganis against the Chinese. However, in the early summer of 1871, the Russians took advantage of the weakness of the Dungans and Chinese to occupy Kuldja. The Atalik then moved north to force the Russians to hold up their advance. The Russians maintained that they had merely taken the land from rebels and were holding it until it could be returned to China. In the meantime the rebels were holding off the Chinese as far east as Barkul and Hami.[38]

From the Russian side again Baron A. W. Kaulbars in 1872 went to Kashgar to make a trading agreement, possibly also a political agreement, with the local (rebel) ruler Yakub Beg. C. Scharnhorst went along as astronomer. He began taking readings on Tokmak, Tash Rabat Pass, Tojuna River, Dolon Pass, Ottuka River, Turugart Pass, and Kashgar. There he viewed a partial eclipse of the sun, June 6, 1872, and brought back considerable geographical data. In accordance with the commendable 19th-century universality of science, Colonel Stubendorff of the Russian War Office sent to the Superintendent of the Trigonometrical Survey of India a set of the points astronomically established.[39]

In 1872 Matussovski started with a convoy at Zaisan, crossed Emil Valley from north to south, and then went southwest to Manass, followed the Chinese post road through to Tarbagatai, and reached Schara-Chuluss.[40]

Up to this point nearly all penetration into Chinese Turkestan by Europeans had come from north or south, and the one effort to enter from the east had failed.[41] Ney Elias made the first successful trip east to west.

Elias started from Pe-king in 1872 through an area over which firm Chinese control had gradually been extended over the defeated Moslem rebels. He started out with only a Chinese servant as company, to

[38] Shaw, "Central Asia in 1872," in *PRGS*, 16 (1872), 395–409; *PRGS*, 16 (1872), 261.
[39] *PM*, 19 (1873), 392–393; *JRGS*, 48 (1878), 226, 232; *JRGS*, 40 (1870), clxv.
[40] *PM*, 19 (1873), 150–151.
[41] Mitchell Grant in 1863 had crossed from Peking to St. Petersburg via Mongolia, but he had not crossed Chinese Turkestan – *PRGS*, 17 (1873), 191.

locate the ancient Tartar capital of Karakorum and then to locate the Chinese colony of Ili, which had for some time been occupied by the Russians at New Kuldja. This route led from the province of Kan-su, the terminus of the Great Wall, as then known, on to Hami, Barkul, north of the Tien Shan, and to Kuldja. It actually took 113 days for the caravans to make that trip. Later on he recruited two natives to accompany him. He passed Uliassutai on November 2 and Kobdo on November 28. On December 17 he met some Russian traders at Chui. He joined them and continued with a little more personal security. Continuing west, he reached Bisk January 4, 1873. He had failed to find Karakorum.

His trip was a traverse route from Kuei-hwa-cheng to the Russian border, about 1300 miles, and along which he made many astronomical observations. The next year, 1873, having returned to England, he won the Founder's Medal and high praise from Sir Henry Rawlinson.[42] Then in 1884 Lord Dufferin sent him to Yarkand and Kashgar to take up further exploration. He started from Ladak and after passing Yangi-Hissar turned west to the Oxus to visit the Afghan Boundary Commission before proceeding to Kashgar.[43]

Also in March 1873 a French explorer, Abbé Armand David, travelling in China and making a geological and mineralogical collection, reached the edges of Kan-su on his way west, but political conditions did not allow him to proceed. He saw signs of terrible destruction in Kan-su, evidently the result of Chinese reconquest of rebel territory.[44]

Berzenczy, a Hungarian who started from St. Petersburg in May, 1873, travelled to Vernyi, Takmak, Naryn, and Kashgar, where he was kept prisoner for a long time. Finally in Yarkand he met the Forsyth Company and accompanied them to Shadula, Karakoram Pass, and Leh, which they reached in 1874. Thus Berzenczy was the first person known to cross Central Asia from north to south since Madatov over a hundred years before.[45]

For the British the most significant development of the early 1870's

[42] Markham, "The Fifty Years' Work . . . ," in *JRGS*, 50 (1880), 71; Elias, "Narrative of a Journey through Western Mongolia," in *JRGS*, 43 (1873), 108–156, Abstract in *PRGS*, 17 (1873), 191–197. He also compiled lists of linear measurements, exchange rates, silver values, weights, coins, taxation, prices of English goods, and systems of time reckoning – *PRGS*, 17 (1873), 196.
[43] *PRGSM*, 8 (1886), 189.
[44] *La Nature*, 1 (1873), 211.
[45] *PM*, 30 (1884), 462.

was the T. D. Forsyth Mission. Sir Douglas Forsyth as early as 1868 was sent to St. Petersburg on a mission to gain a Russian agreement not to penetrate further than the Tien Shan Mountains, that is, to leave the Chinese a free hand to reassert their authority in the area or to leave it to local rulers.[46]

After Forsyth's return from St. Petersburg the Viceroy, the Earl of Mayo, called him to lead a small expedition to the court of the Atalik Ghazi and establish friendly relations with the native government. This exchange would, in fact, represent recognition of the independence of the Turkestan from China Proper. When Shaw heard of the expedition, he volunteered, and the Viceroy called him to India to participate.

The party set out from Ladak early in July, 1869. It consisted of Forsyth, Shaw, a Dr. Henderson, Mirza Shadi, and Yakub Khan (brother-in-law of the Atalik). Dr. Cayley accompanied them as far as Chang-chenmo. They left Chang-chenmo March 2 but suffered great loss when supplies of barley for the horses failed to appear. They finally reached Shadula after losing nearly a hundred ponies. Of course they had enjoyed no dependable communication with the government in Kashgar. At Shadula the party learned for the first time that the Atalik had gone on a military expedition against the Dungans (Tunganis) in Kucha, Turfan, and Urumchi. In several months only one messenger had come through with letters, and these were for Mirza Shadi. Whether this messenger had informed Mirza of the campaign, the party never learned.

Forsyth considered it fruitless to try to wait out the return of the Atalik, so he returned with his party. Dr. Cayley again joined the party at Shadula, but he left before the return journey began. On his way south Cayley passed south of the Karakash and across the Makiksha plain, then into the upper Karakash River via an easy pass. He followed the river upstream to Kizil-jilga; then he entered the Chang-chenmo watershed along the sheltered valleys. Impressed by the easy travel, he sent word to Forsyth, recommending that he follow that route, too.[47]

[46] Murchison, Address, in *JRGS*, 40 (1870), clxiii–clxv, and *PRGS*, 15 (1871), 287–288; *PRGSM*, 9 (1887), 124; *PRGS*, 14 (1870), 317–318. Lord William Hay had proposed such a trip in 1863, but it evidently did not materialize – *JRAS*, 33 (1863), cli.

[47] Henry Cayley to Rawlinson, Leh, September 20, 1870, in *PRGS*, 15 (1871), 24–26; Forsyth to Murchison, Shadulla, September 19, 1870 in *PRGS*, 15 (1871), 23–24; "Route of Ibrahim Khan from Kashmir through Yassin to Yarkand in 1870," in *PRGS*, 15 (1871), 387–392. Ibrahim Khan supported Forsyth's expedition but followed it by a different route.

Robert B. Shaw of the Forsyth party was detached from the rest to explore the routes from Yarkand and Ladak about the head of the Karakash River and the upper Shayok River. In this area he discovered the rugged aspect of the high plateau and located a huge, eroded limestone mountain range near the watershed. Once across the slope he followed a river bed, largely frozen, only to have to retrace his steps for three days. Only then did he find the real watershed between the Indus and Central Asia. He found that the Karakoram mass was not a range, and that east of the peak there was no continuation, while on the west the Mustagh Range began.[48] He brought back specimens of all strata and rocks along the way. On his return Shaw fell ill with rheumatic fever. When he recovered, he was appointed British Commissioner in Ladak.[49]

Forsyth in the meantime served for a while as Commissioner of Fyzabad, but the next year the Viceroy Lord Mayo determined to send a second mission to Kashgaria and with the same leader. In the autumn of 1873, therefore, Forsyth set out on this second political mission to visit the Atalik Ghazi in Kashgar. This time the party included Colonel T. E. Gordon, Captain J. Biddulph, Captain H. Trotter; Captain E. F. Chapman, R.A.; the native surveyor Abdus-Subhan; Dr. Ferdinand Stoliczka of the Geological Survey of India and his native taxidermist; Rasaidar Afzal Khan, A.D.C. to Forsyth; Asmat Ali, hospital assistant; and an escort of Infantry and Corps of Guides; Dr. H. W. Bellew, Surgeon-Major, Bengal Staff Corps; Corporal A. Rhind; Munshi Fyz Bakhsh, Persian Secretary; Tara Sing, Treasurer and Accountant; Jamadar Siffat Khan, leader of a cavalry detachment. The party left Murree, July 19, 1873; but the real point of departure for the expedition was Leh, which they left September 29. The total size of the party that started out was 131. They travelled from Leh to Sasser Pass over 15 miles of glacier, then on to Shahidulla. At times the weather was too bad for them to put up their tents at night, and they asked for shelter in Kirghiz huts. They found yaks more practical than horses for bearing burdens.[50]

Passing Karghalik and going down the northern slopes, they reached

[48] Shaw to Murchison, Peshawar, December 8, 1870 in *PRGS*, 15 (1871), 175–179. The limestone ridge was evidently the one incompletely identified by Thomson in *Western Himalaya and Tibet*; Shaw to Murchison, Lahore, March 18, 1871 in *PRGS*, 15 (1871), 179–180; *PRGS*, 15 (1871), 289–290.

[49] Shaw to Murchison, Lahore, February 20, 1871 in *PRGS*, 15 (1871), 179.

[50] Forsyth to Sir Bartle Frere, Shahidula, October 18, 1873, in *PRGS*, 18 (1874), 111–115.

Yarkand, where they were well received and were allowed the freedom of the city. Here the size and supply of goods surprised them.[51]

The first goal of the expedition was Yakub Khan or Yakub Beg, who had been the ruler of the area around Yarkand since near the beginning of the revolt. They found the city at an altitude of 1,140 meters above sea level, in the same spot as when Marco Polo had passed through it. It had a wall with five gates and measured five kilometers in circumference. Population was about 40,000, and the city enjoyed a market one day a week. The water supply was by aqueducts from the river. 120 mosques were in the city, but all were miserable and poor. There were 36 schools with up to 20 students each.

The mission left Yarkand for Kashgar on November 28, 1873. En route they passed the towns of Kok Rabat, Yangi Hissar, and Kizil. In Kizil, a town of 6,000 houses, they were surprised to find iron foundries which, although primitive in operation, turned out very creditable products. In Khotan they found a center of silk production and cultivation of the silk worm, and there was considerable cotton cultivation. They found the army of the Emir armed principally with the *tai-fou*, a gun two yards long, firing a 50-gram bullet. It was a crew-served weapon, requiring four men.[52]

Both in Yarkand and Kashgar the local inhabitants, even including the women, overcame their shyness enough to come to Dr. Bellew for medical treatment. In Kashgar he even set up a public dispensary.[53]

As far as Kashgar they simply checked the survey figures obtained by Shaw and Hayward; but from that city Gordon led a survey party via Chakmak forts, Besák, Chüng Terek, Pas Kurgan, Turgatbala to Chadir-kul Lake, 100 miles north of Kashgar and within the Russian frontier, thus for the first time linking the survey across Asia. So the English and Russian scientists met in a link across the continent. From the north and west the survey had been brought to Chadir-kul and even to Kashgar by Poltoratski in 1867 with a surveying expedition that crossed the Naryn River and opened the old routes to Kashgar.[54]

[51] Forsyth [to Frere], Yarkand, November 12, 1873 in *PRGS*, 18 (1874), 115-117; *idem* to Sir Robert Montgomery, Yarkand, November 23, 1873 in *PRGS*, 18 (1874), 222–224.

[52] "Les populations du Turkestan oriental," in *La Nature*, 3 (Part 1) (1874–1875), 98–99.

[53] Forsyth to Montgomery, December 11, 1873, in *PRGS*, 18 (1874), 224–226.

[54] Henry Trotter to Sir Bartle Frere, Kashgar, January 24, 1874, in *PRGS*, 18 (1874), 415–424.

This survey party also found that Turgart Pass, 12,000 feet above sea level, formed the watershed, two rivers flowing from it in opposite directions, to the Aksu and to the Naryn. Then Captain Biddulph took a party east to Aksu, Kizil, and the Yarkand River. He located the Yaman-yar and proved that part of the *Ludwig von* ... MS was accurate. He passed Maralbashi, saw a slab of basaltic rock 2,500 feet above the level of the plain, and was the first to report it. He then continued as far as Charwagh before turning back.[55]

In the meantime the rest of the mission studied the environs of Kashgar, ruins of the ancient city, and the fort, whose construction they placed at some time in the 14th century.[56]

While Hayward, Shaw, and the Forsyth mission were credited with being the first Englishmen in Kashgar, the credit is not unchallenged. In the city they met a man who called himself a Nogai Tatar but who looked English despite his extreme poverty. On the return trip the party employed him as mule driver. At Yangi Hissar he was observed reading the script under a map. When accused of being an Englishman, he ran away. The best explanation was that he was a deserter from the Crimean War and dared not identify himself.[57]

The Forsyth Embassy or Mission started its return on March 17, 1874. On the 21st, at Yangi Hissar, Colonel Gordon and a small party separated to try to return by a more westerly route, while the main body followed the more direct route. Captain Chapman led a small group with the heavy baggage to Yarkand where he arranged for its dispatch to India. He then rejoined the main party. In the meantime Colonel Gordon continued through Siri-kol to Kilá Penja in the Wakhan territory. Unsettled conditions in Afghanistan caused him to give up his proposed itinerary and return to follow the wake of Forsyth.[58]

[55] *Ibid.*; Biddulph, Letter, Kashgar, February 4, 1874, in *PRGS*, 18 (1874), 425–428.

[56] J. Girard, "La mission anglaise à Yarkand," in *La Nature*, 2 (Part 2) (1874), 74–75. For a brief history of Kashgar, see Bellew, *Kashmir and Kashgar*, 306–311.

[57] Captain Biddulph to Colonel Biddulph, Kila Panja, Wakhan, April 14, 1874, in *PRGS*, 18 (1874), 430–432.

[58] Sir Bartle Frere, Address, in *JRGS*, 44 (1874), clxxxi–clxxxiv; Captain Trotter, Letter, Panja, Wakhan, April 14, 1874, in *PRGS*, 18 (1874), 432–433; Captain J. Biddulph to Colonel W. Earle, April 14, 1873, in *PRGS*, 18 (1874), 434–435. This sub-group had by then already made several worthwhile discoveries. They crossed five passes in 20 days' march and identified the boundaries established between the domain of the New Emir of Kashgar and that of the Emir of Kabul. Rumors had a Russian embassy arriving only a few days after the British departure from Kashgar, but the Mission did not see it.

Captain Trotter, who was primarily interested in the survey, had carried out part of his assignment as far as the Artash [Irtysh?] Valley, past Chadir-Kul, and a part of the way to Uch-Turfan and to Belowti Pass. He saw nothing of the Terek Pass. During the return trip he had no chance to go very far east, but he detached a native explorer from his train and told him to go as far east as possible and report what he saw. The explorer went as far as the Sorghak goldfields, returned to Keriya, crossed the Kun-lun to Tibet, passing the town of Noh, and then returned to Leh.[59]

For his survey work on this expedition and other accomplishments with the Trigonometrical Survey Captain Trotter in 1878 received the Patron's Medal of the Royal Geographical Society.[60]

The amount of geographical data brought back made this expedition clearly the most fruitful British venture into Kashgaria. Each of the principal members wrote contributions based on his own experiences and observations. In particular, Colonel Gordon wrote the first account of any length on the Valley of Sari-kol.[61] Forsyth himself reported on buried cities in the desert, where the sand sometimes uncovered them, and on the sale of tea taken from such ruins.[62] He also noted that, far from being a formidable barrier to armies, the passes in North India had in the past seen so many armies pass that a wall had evidently been built to keep the armies out of Khotan and Yarkand. Forsyth found traces of such a wall between Sosser and Karakoram Pass.[63]

The present effort to list all European travellers in the Turkestan must record one more, even though his name is not known. The Forsyth expedition met a "Magyar" Pole who claimed to be an ethnologist studying the origin of his race. This search had already taken him to Kashgar. When Forsyth's party tried to use him as a messenger, he caused trouble for the mission, which led the British to suspect that

[59] Trotter, "On the Geographical Results of the mission to Kashgar under Sir T. Douglas Forsyth," in *JRAS*, 48 (1878), 173–234 and discussion in *PRGS*, 22 (1878), 288–291; Trotter, "Account of the Survey Operations in connection with the mission to Yárkand and Kashgar in 1873–74,"* reported in a volume of *Reports* not otherwise identified – *JRGS*, 48 (1878), 179.

[60] *PRGS*, 22 (1878), 255, 298–299; *JRGS*, 50 (1880), 70.

[61] Gordon, "On the Watershed . . . ," in *JRGS*, 46 (1876), 381–396.

[62] Forsyth, "On the Buried Ruins . . . ," in *JRGS*, 47 (1877), 7; *PRGS*, 21 (1877), 27–46; Forsyth to Frere, Yangi Hissar, April 10, 1874, in *PRGS*, 18 (1874), 439–444.

[63] Forsyth, "On the Buried Ruins . . . ," in *JRGS*, 47 (1877), 3; J. Girard, "La mission anglaise à Yarkand," in *La Nature*, 2 (Part 2) (1874), 74–75.

he was a Russian spy engaged in keeping an eye on British movements.[64]

In 1873 the Americans enter the picture for the first time. Eugene Schuyler, Secretary of the U.S. Legation in St. Petersburg, by virtue of the friendly relations that existed between the U.S. and Russia, obtained permission to travel through Russian Turkestan to Issyk-Kul, thence on to Kuldja, the only point in Chinese Turkestan that he reached. He returned along another route through southern Siberia.[65]

The rest of the decade belongs to the Russian side. English activity languished, though the interest of geographers continued unabated. This period represents the renewed effort of the Chinese Empire to bring the Turkestan back under its effective control. While the British seem to have maintained a neutral position, the Russians, in accordance with the terms of the Treaty of Pe-king, supported the Chinese and even helped feed their armies in the campaign against Emir Yakub Beg. This attitude is understandable. The Russians had no love for the Emir and had already once expelled him from Russian Turkestan when their grip tightened on Kokand and Andijan.[66]

In 1875 a Russian political party set out to analyze the Dungan Revolt and to open trade outlets. It consisted of Sosnoffski of the General Staff, Topographer Matusofski, Dr. Piassetski, a Mr. Andriefski of Irkutsk, a photographer, Boiarski, a Chinaman from Kiakhta to act as interpreter, and a Cossack guard of three men. They went to Pe-king, then up the river to Han-kow, up the Han-kiang to Shen-si Province, then northwest via Han-Chung-fu, Hami, Barkul, and Guchen (Kuchun), a total of 2,800 miles.[67] They brought back specimens of plants and animals, Chinese art and industry, and photographs of the inhabitants, buildings, and monuments. These were the first Europeans since the Middle Ages to visit and describe the towns of Hami and Guchen or to cross Dzungaria.

This same year, 1875, Przhevalski was also in this northern region on his third expedition. This was the one which brought him to

[64] *PRGS*, 22 (1878), 290.

[65] Schuyler, "A Month's Journey in Kokand in 1873," in *PRGS*, 18 (1874), 408–414.

[66] *PRGS*, 20 (1876), 492.

[67] Henry C. Rawlinson, Address, in *JRGS*, 45 (1876), clxxiii; *PRGS*, 20 (1876), 421; Deniker, "Explorations russes," 419; Piassetski, "Voyage à travers la Mongolie et la Chine"; "Colonel Sosnoffski's expedition to China in 1874–5" [abridged and translated from the Russian by Captain F. C. H. Clarke . . .] in *JRAS*, 47 (1877), 150–187.

Guchen, whence he crossed to Kulja and continued to the south.[68]

Also in 1875 the Geologist and Mining Engineer Mushkétov studied the mountains between the Pamirs and the Tarbagatai and between Kuldja and the Tien Shan as far as Perovsk. The same year Romanovski explored the "Alexander" Range, western Tien Shan, the Trans-Ilian Ala-tau, and areas north of them.[69]

Continuing its interest in the area, the Statistical Section of the Russian Geographical Society appointed a committee to study the proposal of Soboly and Jansson to publish a gazetteer on Central Asia, including historical geography and ethnology of the area. While it restricted itself primarily to Russian Turkestan, it was to include border areas like the Hindu Kush, Karakoram, and the Irtysh watershed.[70]

This same year Regel, son of the famous botanist, accepted the post of surgeon to the Kuldja District, took up residence there, and began collecting specimens of plants and animals for the St. Petersburg Academy and the Botanical Gardens. At the same time Captain Larionov and assistants were doing a similar work in the hill tracts of the same district.[71]

The next year, 1876, Kuropatkin crossed all of the western part of Chinese Turkestan, crossing at Terek-davan into the Kashgar depression. Thence the party went to Maral-bashi, Ak-su, Kucha, and Kurla. The party consisted also of Kuropatkin's brother, a Mr. Wilkins (?), and Captain Sounargoulov. The latter returned by a new route: Ak-su, Uch-Turfan, Bedel Pass, and Issyk-Kul.[72]

Grigor Nikolaevich Potanin spent the winter of 1876–1877 in Kobdo on the first of his expeditions. He complained of the cold and high prices. However, his exploring party continued its ethnographic and zoölogical studies and collected a number of biological specimens. In May they left Kobdo in two parties; one went to Hantschai, the other with Potanin went to Hami, then to Uliassutai. They followed the trade route over Ulan-davan Pass to the source of the Barlyk and the Altaïn-Nuron Mountains, a continuation of the Altai. They then crossed the Gobi and reached the Chinese town of Santarou (Kurassu, Kara-su). They stopped at Barkul, then returned to Hami. Thence

[68] *PRGSM*, 5 (1883), 495; *PRGS*, 22 (1878), 51–52.
[69] Deniker, "Explorations russes," 425; *PRGSM*, 1 (1879), 125–126, 356.
[70] *Nature*, 12 (August 12, 1875), 299.
[71] "Russian Explorations in Asia during the Past Summer," in *Nature*, 14 (October 12, 1876), 534–535; *PRGS*, 22 (1878), 341; Regel also published an account in letter form in *Gartenflora*.*
[72] Deniker, "Explorations russes," 428; *JRAS*, 48 (1878), 228.

they went to Kometr-davan Pass, the north edge of Karlyk-tag (Karlük-Dagh), then to Chou tou (Sarpes). At Nomtologoï they left the Tien Shan, turned north into the Gobi again, and reached Adjia-bogdo, a branch of the Altai. They crossed the Altai by the Kara-nuron-davan Pass between Saksa and Tsitsirin-gol, Taimir-ula, then Dzasayktu-Khan. Finally they reached Uliassutai again. They had collected mostly mountain flowers.[73]

In 1876 General Kaufmann ordered Major General Skobelev to lead a military party into the Alai area and make a show of force before the Kirghiz nomads. The party marched out in three columns with instructions to meet on the Alai. Because of the poor cartography available the expedition took along a topographical party of eight men Bonsdorf had charge of astronomical and barometrical work; W. Oshonin led the Natural History Section, and Captain Kostenko was geographer and statistician. Prince Witgenstein was one of the military leaders.

On July 18 (30) they reached Gulcha, the most advanced Russian outpost in Central Asia. On the 28th they reached the vicinity of Terek-davan. Then they continued into the Pamir and to Kizyl-su and Kaufmann Peak. Early in August they reached Kara-Kul Lake, which they surveyed while the men suffered considerably from the altitude.

In August Kostenko led a small party to Lake Riang-kul in the Sari-Kul District near the Kashgar boundary and to the confluence of the Chon-su and Uz-bel-su rivers, finally the Uz-bel Pass, which separates the Kara-kol from the Sari-kol, that is, the watershed between east and west.

Lieutenant-Colonel Lebedev partially surveyed the ground about this area and prepared a map at 2 vërsts to the inch. In all he mapped 3,700 square vërsts of the Pamirs. Operations then turned back to the Kokand area. The expedition had made a very slight entry into Chinese Turkestan, but their map and surveys of the border entitles the expedition to be mentioned here.[74]

The relatively easy access of the Russians to the Dzungarian area or the Ili Valley, at that time called T'ien Chan Pe Lu by the Chinese, and to the Tien Shan Mountains is in large part explained by the fact that the area had been occupied by the Russians since July 4, 1871

[73] *PM*, 24 (1878), 38; *PRGS*, 22 (1877), 52; *Nature*, 17 (March 28, 1878), 434; Deniker, "Explorations russes," 420.
[74] Michell, "The Russian Expedition to the Alai and Pamir," in *JRAS*, 47 (1877), 17–47.

on what they called a temporary basis. The weakened Chinese Empire could not at the moment do anything but protest through Marshal Jung, an envoy to the area. In September, 1872 General Bogoslavski reached Pe-king with the mission of persuading the Emperor that he should, in the Empire's interests, allow Russia to administer the area. A few months later the Chinese sent word to Ambassador Butzov that the Russians should take such matters up with the Viceroy, Tso, of Kan-su, and with General Chen-si of the army in the west. Tso had entered the Turkestan with an army to reconquer the area. In 1874 he reconquered Hami[75] but was held up by a lack of supplies and the political changes attendant on the death of the young Emperor T'ung Che in January, 1875. Finally in 1876 he began his march again. That year he reconquered Urumchi, and Manas,[76] and in these places he took such cruel revenge on the Moslem population for their rebellion that General Kaufmann, Governor General of Russian Turkestan, had to protest.[77]

In May, 1877 Yakub Beg died, and his successor was unable to maintain the government. The Chinese army marched around the Tarim Basin, winning a series of victories; Ak-su on October 19, Yarkand on December 21, Kashgar on December 26, and finally Khotan in January, 1878.[78] Except for some border raids the rebellion was over.[79]

Having put down the rebellion which ostensibly occasioned the Russian occupation of Dzungaria, the Chinese sent General Ch'ang-hou to ask for its restitution. Under circumstances that are difficult to

[75] Tso-Tsung-T'ang [Monthly Ration for troops in Hami], Chüan XLV, No. 4, in *Guide to the Memorials of Seven Leading Officials of Nineteenth-Century China*, p. 155; *idem*, [Transportation of Provisions to Sinkiang], Chüan XLVII, No. 2, in *ibid.*, pp. 157–158; *idem*, [Establishment of Postal Stations in Sinkiang], Chüan XLVIII, No. 2, in *ibid.*, p. 159; *idem*, [Delivery of Funds to Tarbagatai in Sinkiang], Chüan XLVIII, No. 3, in *ibid.*, p. 159.

[76] Tso-Tsung-T'ang, [Capture of Ti-hua in Urumchi,] Chüan XLIX, No. 1, in *Guide to the Memorials* . . . , p. 160; *idem* [Capture of Manassu,] Chüan XLIX, No. 11, in *ibid.*, p. 161.

[77] Tso-Tsung-T'ang, [Capture of Four Cities in Southern Sinkiang,] in Chüan LII, No. 9, in *Guide to the Memorials*, p. 165; *idem*, [Punishment of Officials who Defended Kashgar,] in Chüan LII, No. 11, in *ibid.*, p. 165.

[78] Tso-Tsung-T'ang, [Arrival of New Governor of Urumchi,] Chüan L, No. 20, in *Guide to the Memorials*, p. 162.

[79] Tso-Tsung-T'ang, [Suppression of rebel Leader of Andijani, A-li-ta-shih, who crossed the Russian Border to Sinkiang,] in Chüan LIII, No. 19, in *Guide to the Memorials*, p. 167; *idem*, [Invasion by Andijani and Burut Tribes . . . Repulsed,] Chüan LIV, No. 6, in *ibid.*, 168; *idem*, [Andijani Tribes . . . Expelled from Kashgar,] in Chüan LV, No. 4, in *ibid.*, p. 169.

conceive, he and Prince Gortchakov at Livadia on the Black Sea, signed a treaty to end the dispute. Mostly it allowed the Russians to have their way.[80]

Of the 18 articles the provisions that most concern us here were that Russia should keep Muzart Pass and the greater part of the Ili Valley. The Russians received commercial privileges, and they had permission to travel in China. China allowed Russia to establish consulates at Kia-yü-kuan, Kobdo, Uliassutai, Hami, Turfan, Urumchi, and Guchen, in addition to those already allowed at Ili, Tarbagatai, Kashgar, and Urga.[81]

This transfer of most of the area between Dzungaria and the Tien Shan to Russian sovereignty cost Chinese Turkestan a large section of its most fertile valley.[82]

[80] Tso-Tsung-T'ang, [Criticism of Draft Treaty with Russia Concerning the Restoration of Ili to China,] Chüan LV, No. 8, in *Guide to the Memorials*, p. 168; *Idem*, [Draft Treaty Signed by Ch'ung-hou in Moscow; Demarcation of Boundaries and Compensation for Russia,] in Chüan LV, No. 7, in *ibid.*, p. 168.

[81] Cordier, *Histoire générale*, IV, 151–164; *Propyläen-Weltgeschichte*, IX, 441–442; Gerhard Menz, *Der Kampf um Nordchina*; *Nature*, 31 (December 18, 1884), 156; Archibald R. Colquhoun, "Russian Central Asia: Countries and People," in *Scientific American Supplement*, No. 1281, Vol. 50 (July 21, 1900), pp. 20537–20538, 20544–20545. This is a summary of Chinese sovereignty over Dzungaria and apparently is a reprint from the *Journal of the Society of Arts*.*

[82] Réclus, *The Earth and Its Inhabitants*, Asia, Vol. 2, 90.

IV – THE RECONNAISSANCE PERIOD: 1878 TO THE DEATH OF PRZHEVALSKI

While diplomatic relations remained in a state of turmoil for several years after the Treaty of Livadia,[1] scientific work on the ground went on apace. The greatest activity came from Russian territory, where access was easier along an extensive land boundary. At the same time British access was channeled into the narrow approaches via Karakoram Pass and on rarer occasions west from Pe-king. Aside from Sino-British difficulties on the littoral, other Chinese objections plagued British explorations. During the period of the Moslem uprising in Sin-kiang and the reign of Yakub Beg, the British had made direct efforts to open diplomatic relations with the Emir and evidently were ready to recognize Turkestan independence. Such policy did not sit well with the Chinese Empire. The Russians had at no time favored the Emir's government but had actively helped China recover most of the territory. Still, they alienated any feeling of grateful friendship by their continual nibbling away at the Chinese boundaries in the west and north. Under such conditions a policy seeking to exclude foreigners from the Empire may have been unreasonable, but it is understandable.

One of the foremost of the Russians in this period was A. Regel, a botanist and Director of the Imperial Botanical Gardens in St. Petersburg. His first expedition, 1876–1877, set out to explore the Issyk-Kul and then to go on to Kuldja. In August, 1877 he entered the Tien Shan area and crossed the Jagatai Pass of the Ak-Bortash Mountains and reached the Tekes. That same month he also passed Muzart Pass, going on to reach the south edge of the Kashgar-Muzart Glacier. Then he crossed the Kehen Valley, returned to Issyk-Kul, and ended his trip

[1] Tso-Tsung-T'ang, [Necessity of Restoration of Ili to China,] Chüan LIII, No. 9, in *Guide to the Memorials of Seven Leading Officials of Nineteenth-Century China*, p. 167; *idem*, [Necessity of Establishment of Sinkiang as a Province,] in Chüan LIII, No. 9, in *ibid.*, p. 167; *idem*, [Request ... permission to Suspend Border Trade with Russia ... pending Restoration of Ili to China,] in Chüan LIII, No. 15, in *ibid.*, p. 167; Li-Hung-Chang, [Discussion of Treaty Signed by Ch'ung-hou with Russia at Ili and Proposal for Acceptance,] in Chüan XXXV, No. 10, in *ibid.*, p. 295.

at Karakol on August 28. On the way to Sairam Nor he noted the old city of Kuldja in ruins.[2]

Regel's second expedition left Kuldja May 4, 1879 for Schicho, where earlier he had the co-operation of local officials in preparing for further travel. This aid was not given this second time, and he had to return to Kuldja. He spent July exploring the Kash Valley and the south slopes of the Iren Khabirga. He found a hitherto unknown glacier to be the source of the Kash River. Finally overcoming the delays in obtaining travel permits, he started again in September and crossed the Arystan-davan Pass into the Valley of the Kunges. September 14 he reached Adunkur Pass in the Little Yuldus area and gradually approached Turfan. On September 28 he reached the barren plains, and on the 27th he met the Tarantsin, who were friendly but curious. They had never before seen Europeans. On his 74th day out of Kuldja he reached Turfan, the first European in recent centuries to see the city. While Benedict Goës visited the city in the 17th century, his reports tell us little.[3]

Regel finally received permission to stay and to get lodging and food, but he was closely watched. He managed to walk about and made some geographical observations.

In November Regel made a trip out to Burliusk and then to Kara-Gudsha (Kara-khoja?), where he reported on the ancient ruins, especially one which he called the city of Takianus, after an emperor of 400 years before. Finally he could not get permission to go on to Lob Nor but had to return to Urumchi via Toksun and Davan shan, in the Bogdo-Ola Mountains. There, too, he met with inhospitable treatment. He finally managed to pass by way of Sandshi (Tsangi), Kotuby, and Pikete Chudu and completed his return via Manass and Shuko.[4]

On his return Regel brought a great many new plants and other specimens, which he later described in *Acti Horti Petropolitani*.[5]

In 1878 M. V. Pievtsov accompanied a large caravan of Bisk merchants from Kobdo to Kuku-Khoto (Chinese Kwei-hua-cheng) along a route between that of Elias and that of Sosnofski in 1875. He there-

[2] *PM*, 25 (1879), 376, 408; Regel, "Meine Expedition nach Turfan," in *PM*, 27 (1881), 380–394, plus map; Deniker, "Explorations russes," 419.

[3] Ritter, *West Asien*, I, 2nd Ed., 1837, p. 432.

[4] Regel, "Turfan," in *PM*, 26 (1880), 205–210; Morgan, "Dr. Regel's Expedition from Kuldja to Turfan in 1879–80," in *PRGSM*, 3 (1881), 80; *PRGSM*, 3 (1881), 340–352.

[5] *PM*, 26 (1880), 399; article on Turfan in *Izvestia* of the Russian Geographical Society (1881?), reported in *Nature*, 24 (March 16, 1882), 472.

fore crossed some of the least-known districts. Accompanied by two topographers, he left Kobdo September 6, 1878 and passed Lake Kara or Ike-Aral-Nor along the Southern Altai and a mountain chain Madotu-ula (also called Sirke) to the banks of Dsabhin (called Jabkhan by Elias), to a Buddhist temple along the slopes of the Sangai to the Gobi, Ta-ching-sa or "Great, Bright Mountains", reaching the destination December 10.[6] Pievtsov went through the same valley when he was escorting a caravan to Gutchen (Guchen, Gutschen); his description completed the observations of Sosnofski.

Also in 1878 a mining engineer and geologist Mushkétov crossed the Trans-Alai Range and reached the banks of the Muk-su, visiting Kara-Kul Lake, measuring the Zarafshan Glacier, locating the source of the Macha River in the glacier, and then returning to Osh and on west. He found peaks as high as 20,000 feet in the glacier area. His measurements of the valley elevations (8,000 to 12,000 feet) and his explanation of the valleys as dried-up lakes received wide acceptance.[7]

Graf Bela Széchnény, accompanied by Lieutenant Kreitner and Loczy of the Geological Department of the Vienna Museum, in another effort to breach the area from the east, left Shanghai in December, 1879 and sailed to Lan-chow, then proceeded up to Su-chow. His expedition eventually reached the Kum-bun Lamasery. At Si-ning he met G. F. Easton, an agent of the China Inland Mission.[8] In order to reach the Lob-Nor, he would have had to go via Hami, Turfan, and Karashahr, since the direct route had not existed for the last century. Then Széchnény gave up the idea of seeing Lob-Nor and went on to Tibet. Kreitner, a member of the expedition, later wrote a report on the travels, showing that they were unable to get to Lhasa but came back through Burma.[9]

In 1879 also Henry Lansdell, a penologist, set out to examine the

[6] Morgan, "On the Pievtsov Expedition . . ."; article and map by Pievtsov in *Izvestia* of the Russian Geographical Society (1881?), reported in *Nature*, 25 (March 16, 1882), 472;* Pievtsov also had an article on his journey through Dzungaria and map in No. 1 of *Zapiski* of the West Siberian Branch of the Russian Geographical Society (1881?) – *Nature*, 23 (January 13, 1881), 255.

[7] Markham, Address, *PRGSM*, 1 (1878), 356; *Nature*, 23 (November 11, 1880), 44, reporting a paper read by Mushkétov at the Mineralogical Society of St. Petersburg, October 26 [1879?]. In 1881 Mushkétov received the Constantine Medal for his geological researches in Central Asia – *Nature*, 23 (March 10, 1881), 443. Ivanov, who accompanied Mushkétov, in 1882 received the Silver Medal of the Russian Geographical Society.

[8] *Nature*, 21 (April 1, 1880), 527.

[9] *PM*, 26 (1880), 29, 234.

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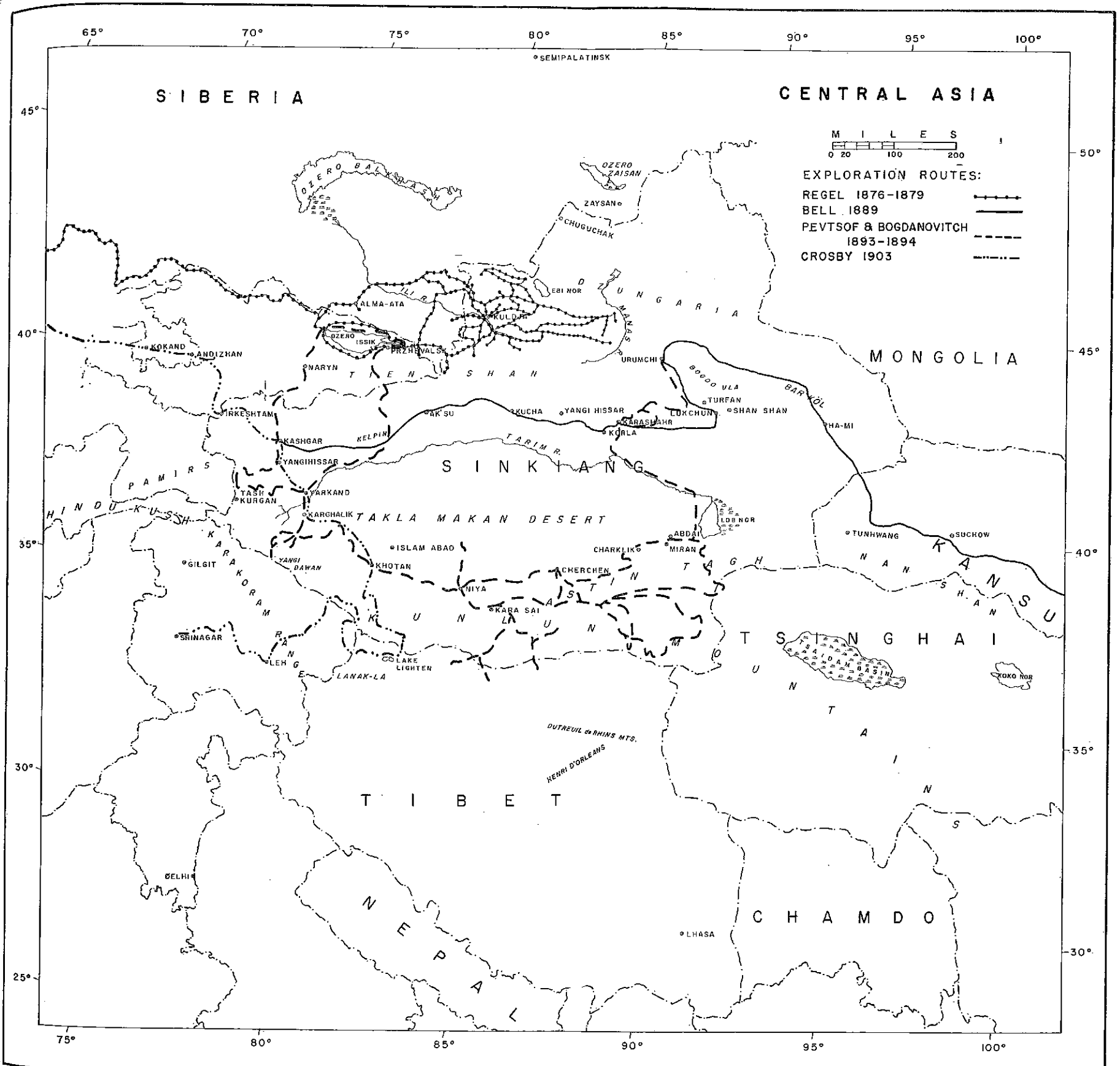
SIBERIA
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EBI NOR
ALMA-ATA
ILI R.
KULDJA
OZERO ISSIK
PRZHEVALSK
KOKAND
ANDIZHAN
NARYN
TIEN SHAN
URUMCHI
BOGDO ULA
BARKÖL
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TURFAN
SHAN SHAN
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TASH KURGAN
KARGHALIK
TAKLA MAKAN DESERT
LOB NOR
ABDAL
CHARKLIK
MIRAN
TUNHWANG
SUCHOW
KANSU
NAN SHAN
ISLAM ABAD
GILGIT
YANGI DAWAN
KHOTAN
CHERCHEN
NIYA
KARA SAI
ALTUN SHAN
KUN LUN
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prison system in Siberia. His route did not enter Chinese Turkestan, but it closely followed the southern or Chinese frontier and touched at Kiakhta. His trained eye and inquiring mind made his observations of the area extremely valuable.[10]

Potanin's Second Expedition, 1879, took him to Mongolia, the Tannu-Ola, and Lake Kosso-Gol, where he made a better collection of plants, but it was unhappily destroyed by a fire in Irkutsk in 1880.[11]

In 1880 a Japanese attaché at the legation in St. Petersburg started home by way of Central Asia, both Russian and Chinese Turkestan. He described the land and people with some detail and included some historical notes on places along the way. Unfortunately the manuscript of this account was not published immediately; indeed only in 1911 did it see print, and then in an Italian translation. By then the information had lost its immediacy, and the political situation had changed considerably.[12]

Hermann Mandl, a German, studied Chinese in Pe-king for several years and then joined the army of General Tso-Tsung-T'ang as interpreter. He accompanied the army in 1880 on its march from Eastern China to Hami, where the military force had the task of putting down the Dungan Rebellion and bringing pressure to bear on Russia to return to China the section of Dzungaria left to them by the Treaty of Livadia.[13]

In 1880 Delmar Morgan travelled from Tashkent to Kuldja in order to check on Russian geographical work there. This trip was easy enough to make since Russia had not entirely evacuated the area. Nonetheless Russian-Chinese tension was high. Morgan's description of the city of Kuldja under these circumstances is especially valuable.[14] Morgan evidently knew the Russian language well and later made his most significant contributions by translating and reviewing Russian scientific works for British journals.

The Chinese refusal to accept the Treaty of Livadia, the threat of armed force, and pressure from France and England, all influenced the

[10] Lansdell, *Through Siberia.*

[11] *Nature,* 23 (January 13, 1881), 255. F. F. Schwartz, an astronomer from Dorpat, in 1879 determined the position of ten points in Eastern Turkestan and 25 points in the Kuldja area, near the Kash and Kunghes Rivers; he explored as far as the Narat Pass on the Tekes. Some results were published in the *Izvestia* of the Russian Geographical Society (1881?) – *Nature,* 24 (April 6, 1882), 538.

[12] Nishi Tokojiro, *L'Asia centrale* . . . .

[13] Kreitner, *Die Wege* . . . .

[14] Morgan, "A Journey through Semirétchie to Kulja in 1880," in *PRGSM,* 3 (1881), 150–169.

Russians to reconsider the Treaty and to open new negotiations. The result was the new Treaty of St. Petersburg, February 12 (24), 1881. It returned to China the Pe Lou or Valley of the Ili, about Kuldja, and provided for commerce between the two nations.[15]

The next year a boundary commission under Major General Medinski set out to study the new boundaries that resulted from the treaty, along the Tien Shan and in the Ili Valley. They travelled to Muzart Pass and were well received by the Chinese in Ak-su. In October, 1882 they reached Uch-Turfan and examined the Kukurtuk Pass, Koitshe Pass, Bedel Pass, and Sawabzy Chain. This latter is the range shown on maps as forming the border southeast from Sari-Jasyn-tau. It ends at the Ak-su River.[16]

In 1882 a Paris banker, Bischoffsheim, helped the Musée d'Histoire Naturelle to send the G. Bonvalot expedition to Central Asia. They started from Tashkent in November, 1880. In March, 1881 they accompanied the family of an Afghan Emir to Masar-i-Sheriff, to Samarkand, and to Karshi and Kilif on the right bank of the Amu Daria. There they separated from the rest and followed the river to Kishlak, Chushka, and to Ghuzar, then Shirabad, Surchan Valley, and then they followed a caravan route to Hissar. In Zerafshan they hired asses for a train and continued past Iskander, Murra Pass, Dukdan Pass, Voru Pass, and Urgut, then back to Samarkand. In October they went as far as Karakol, then returned to Krasnovodsk.[17]

1883 was the date of Przhevalski's fourth expedition, which set out to explore eastern Tibet and to re-visit Lob-Nor from the Tsaidam side.[18] The expedition returned in 1885.[19]

J. Vriesch in Berne in 1884 read a lecture describing the work of Heinrich Moser, who first entered Central Asia under the native rulers, under the pretense of being a Moslem, then under the Russians as messenger of the Governor General, Tschernajeff (Chernayev). However, Vriesch said that no European had travelled from Russian Asia

[15] Cordier, *Histoire générale* . . . , IV, 164–165; Chang-Chih-Tung, [Treaty Signed by Ch'ung-hou with Russia in Regard to Trade, Taxation, and the Defense of Sin-kiang and Military Preparations against Russia,] in Chüan II, No. 1, in *Guide to the Memorials* . . . , p. 362; *idem*, [Proposed Alteration in the Sino-Russian Treaty,] in Chüan II, No. 4, in *ibid.*, p. 362.

[16] *PM*, 29 (1883), 150–151.

[17] *PM*, 28 (1882), 32, where the names are spelled Karschi, Masar-i-Scheriff, Kischlak, Tschuschka, Schirabad, and Zerafschan; G. Bonvalot, "Sables mouvants et colonnes de brèche du Turkestan," in *La Nature*, 12 (1883), part 1, pp. 343–346.

[18] *PRGSM*, 5 (1883), 552; *PRGSM*, 6 (1884), 592.

[19] Later in this chapter the expedition is treated further.

to India or vice versa since Marco Polo. He evidently knew of neither Madatov nor Berzenczy. There were, however, no scientific results of any moment from Moser's travels. The account was reported in the press and evidently spurred the British on to improve upon the record themselves.[20]

Potanin's third expedition spent three years in East Tibet and East Gobi, 1884–1886. On this expedition he took along Skassi and Berezovski. He started from Pe-king and went to Kuku-Khoto and San-chuan, where he spent the winter. In the summer they explored about Tao-he, Sun-pan, and Lun-an and returned to spend the second winter at the Kumbun Monastery near Si-ning; the third summer they spent on the return journey via Koko-Nor; they crossed the Gobi to Ek-tag Altai, the Hang-hai Ridge, the Orkhon River, and Kiakhta. They had surveyed 44,000 miles; longitude and latitude had been determined in 69 places; they had 200 photographs, 700 specimens of birds and mammals, a bulky herbarium, a collection of lizards, insects, and mollusks. Berezovski remained to do more exploring.[21]

In May of 1885 Arthur Douglas Carey set out on a two-year leave to explore the unknown part of Asia. He was a member of the Bombay Civil Service with a yen for travel. He was accompanied by Andrew Dalgleish, known as a pioneer trader in Chinese Turkestan. He went along as Turki interpreter and general helper. They started from Leh and proceeded into Tibet as far as the Mangtsa and Yeshil-Kul, climbed the Kun Lun, and then proceeded north toward Keriya. Thus they crossed some territory never seen by Europeans before. After a short stay at Keriya and Khotan, where they barely missed Przhevalski, they followed his route to Khotan and down the Khotan River to its juncture with the Yarkand. They then followed the Tarim River to Kucha, Kurla, and Kara-shahr. Carey planned to follow the river to Lob-Nor, but the condition of his horses forced him to go to Korla and Kara-shahr to replace them. By the end of the year they were ready to proceed and followed the river to Lob-Nor. Thus they were

[20] This account and other reports from field explorers showed the British that the mountains north of India were not as formidable as they had thought, and far from protecting India from Russian interests and encroachments, they constituted relatively easy access. It therefore became clear that British interests must protect India by moving even further north – W. M. D. in *Science*, 1 (1883), 79; *PRGSM*, 5 (1883), 12–23.

[21] *Nature*, 37 (December 6, 1887), 141–142, summary of article in the *Izvestia* of the Russian Geographical Society, 3 (1887). The funds for the expedition were in part supplied by the Geographical Society, in part by a Siberian merchant, Mr. Sookachev – *Nature*, 28 (June 21, 1883), 182.

the first Europeans to follow the whole course of the Tarim. After camping a while at the village of Charklik, on April 30, 1886 Carey began the return trip along the Tsaidam. He found a pass through the Altyn Tagh and reached the edge of the Tibetan Highlands, where the small troop travelled eighty-two days without seeing a person, along a track ordinarily used only by Kalmuck nomads. Carey wanted to go as far as possible into Tibet, but he only reached Ma-chu, half-way between the Kun-lun and Tang-La Ranges. Giving up, he struck out north to Hami, then went along the northern edge of Turkestan, via Turfan, Karashahr, Kucha, Aksu, and Yarkand. They finally reached Yarkand on March 7, 1886. They then turned south and reached Leh via the Chang-La Pass.[22]

This expedition marks the climax of English exploration for the century. Carey and his companions had followed the course of the Chimen Tagh Range (called Marco Polo Range by Przhevalski), and crossed the Naichi Pass to the Nan-Shan. He had continued to Ansifan (Ghainshé) by a new route never before used by Europeans, and to Turfan. He had visited Hami and Urumchi, where he was well received by the Chinese governors and given aid for his return. He had made the circle of the Tien Shan area, had visited every large place except Kashgar south of those mountains, and he had circled the Takla-Makan.[23]

Dalgleish himself was an important part of the expedition. Each day during the trip he plotted the topography and distances, and one of the main results of the expedition was the excellent map that was compiled from his data.[24] East Turkestan, which had offered little more than promise for British trade up through the time of Yakub Beg's rule and the Dungan Revolt, was neglected after the Chinese recovery. Then this adventurous English merchant, Andrew Dalgleish, led a caravan to Yarkand in 1883 and stayed there 10 months. Since he was a private trader, not an official, Chinese officials treated him with scorn; but he reported the land at peace. He found the Altyn-Shahr or six-

[22] *PM*, 33 (1887), 190; *PRGSM*, 9 (175–176); *Nature*, 35 (March 17, 1887), 475; *Nature*, 37 (December 1, 1887), 115; "Considering that Mr. Carey travelled without escort and unarmed, and that his journey has been performed on slender means through vast unknown tracts peopled by tribes supposed to be of hostile and fanatical temper, his exploit is one of the most remarkable in the recent annals of adventurous travel." – Strachey, Address, in *PRGSM*, 9 (1887), 342.

[23] Carey, "A Journey round Chinese Turkestan . . . ," in *PRGSM*, 9 (1887), 731–752; *PRGSM*, 9 (1887), 377–378; *PM*, 34 (1888), 57.

[24] A report on his activities was published in the *Allahabad Pioneer** and extracted in London's *Athenaeum* (February 10, 1883).

city area ruled over by a Loschai or commissar who resided in Kashgar, and a Gumba or Governor General at Hami. Each city had its Amban with judges and clerks and garrisons totaling some 40,000 soldiers. Roads and post roads were in good order, but the markets were full of Russian wares at bargain prices, while the Russian Consul at Kashgar used his influence to keep English goods out.[25]

Dalgleish was also something of a medicine man and on the Carey expedition was so free with his services that he gave the British a reputation as medicos that aided them later. From this expedition thenceforth all English travellers were expected to carry medicine chests and to give free medical aid to the local inhabitants. It did not help with the officials, but it made contact with the lower classes easy and meant a friendly attitude on their part.[26] Dalgleish was also something of a man of science, and during the expedition he took 35 astronomical readings.[27]

After this expedition with Carey, Dalgleish returned to Yarkand, established residence there, and opened trade with Leh. During one of his trips in 1888 he was murdered at Karakoram Pass.[28]

The details of the murder are significant to this study because this crime, more than any other one event, started a new cycle of explorations and changed the emphasis of expeditions of the next twenty years. In March, 1888 Dalgleish and his servant Parpi Baï left Leh for Yarkand with a small caravan and some pilgrims. Soon afterwards a Kokand Pathan from Quetta, a no-good trader badly in debt, joined them. They travelled five days together, and just after they passed Karakoram Pass, they camped in the snow. After supper Dalgleish and the trader, Dad (Daoud?) Mohammed, talked together, and Dalgleish advised him to save his money and pay his debts. At the end of the conversation, though there was no evidence of a quarrel, the Pathan went to his tent and came back with a pistol, with which he shot Dalgleish in the shoulder. Dalgleish tried to hurry to his tent where he had his guns; but Dad Mohammed then seized a sword and hacked away through the thick clothing until Dalgleish was dead. The Pathan then took charge of the caravan for several days by intimidation and then chased the others away and headed alone for Kashgar. The

[25] *PM*, 29 (1883), 150; *PM*, 30 (1884), 430.

[26] Younghusband, "A Journey across Central Asia," p. 489.

[27] *Cosmos*, 9 (1887), No. 5, quoted in Younghusband, "A Journey across Central Asia."

[28] Younghusband, "A Journey across Central Asia," 502; *Science*, 1 (1883), 229.

other members of the caravan reached Yarkand and complained to the Chinese officials, but the local amban would do nothing. Dad Mohammed lived openly in Kashgar for a while, although the Russian Consul, Petrovski, urged the Chinese to arrest him. Then, alarmed, he left in the direction of Aksu. When word of this crime reached the British headquarters in North India, Captain Ramsay, with characteristic English independence and assertiveness, ascertained that a certain Lieutenant Bower was travelling in Kashgar. He therefore wrote a secret letter to Lieutenant Bower, instructing him to apprehend and deliver the murderer.[29]

Returning to the period of the Carey Expedition, we must again take up the increasing tempo of Russian exploration. In 1885 Captain Grombechefski received the mission of determining the borders of Ferghana and of Chinese Kashgaria as far as the fortress of Irketchtam (Irkeshtam). In doing this, he explored in the Kashgar region and surveyed the routes he followed, from Kashgar to Ladakh and from Ferghana to the northern boundary of Kashmir. Hostile attitudes from the Chinese followed him all along the way. He arrived in Kashgar on the day a mutiny broke out among the Chinese soldiers, and he barely escaped with his life.[30]

On July 16 (28), 1886 the Russian Tengri-Khan Expedition, led by J. V. Ignatiev, set out from Karakol, primarily to study the glaciers and the volcanism of Central Asia. They moved up the Kok-yar Karkara Valley and to the Semënov Glacier and to another at the source of the Adir-tur, called Mushkétov after the explorer. They then located another, the Inilchik. They descended to the Valley of the Tekes by Naryn-Kol Pass, surveying still another glacier, the Tura-jorg, then to Borodobosup, from which vantage point they photographed the Tengri-Khan for the first time. Topographer Alexandrov made an instrumental survey of the Semënov Glacier, then measured the height of Tengri-Khan (24,000 feet).

A side trip took one draftsman, Khludev, and six Cossacks and an interpreter to Muzart. They made a study of the Muzart Glacier, determining its altitude to be 12,000 feet, and then returned to Kara-kol. At almost every turn the expedition found signs of glacial activity.

A. N. Krasnov, a botanist, in the meantime took one party of this expedition still further, spent the spring of 1886 on the lower Ili near Kurtu and Kopa, and in the late spring reached Ala-Kul. He spent

[29] Bower, "A Trip to Turkistan," in *GJ*, 4 (1895), 251.
[30] *PRGSM*, 9 (1887), 508, reporting a letter from Bonvalot.

July and August exploring the uplands of the Tien Shan about Khan Tengri and the watershed of Syr Daria and the Tarim. He then visited Uch-Turfan before returning to Issyk-Kul.[31]

In 1886 a cholera epidemic broke out in the area about Kashgar, and the Russian Government sent Dr. Seeland to institute proper measures for preventing a spread into the provinces of Semirechie and Ferghana. These provinces, described as remaining in a savage and wild condition, had been brought into the Russian Empire in 1862. They were necessarily almost a terra incognita. Dr. Seeland's travel took him from Verniy to Ak-su and Kashgar by way of Naryn, which compelled him to cross the colossal range of the Tien Shan. His reports constituted a significant contribution to geographical knowledge.[32]

In 1886 the Russian Geographical Society also gave a medal to Madame Alexandra Victorievna Potanina for her help in accompanying her husband on all of his expeditions, forming an herbarium, and keeping the meteorological record for the expeditions.[33] Two years later, in 1888, in recognition of his explorations in China and Mongolia, the Russian Government granted Potanin himself a yearly pension of 800 rubles.[34]

This same active year, 1886, Koudrine, a Central Asian commercial company, sent out a caravan through Kashgar and into Tibet. The names of the persons participating are not known, but the commercial aspect of exploration, travel, and personal contact was thus added to the scientific competition between the leading nations.[35]

At the same time the Russian Imperial Exchequer and a Moscow commercial company financed an expedition to China by Dr. Piassetski, but his itinerary is not clear.[36]

The year 1886 also saw the end of the first real expedition of Bonvalot. He and compatriots Capus and Papin had been exploring in Russian Turkestan and tried to return by crossing Afghanistan and Iran, but they were captured and held prisoner by the Afghans, who finally let them go on the protest of the British resident consul. They then decided to cross over to Karakol, pass by Tuyuk, then go down

[31] Morgan, "Russian Geographical Work," in *PRGSM*, 9 (1887), 425–426.
[32] *Nature*, 39 (December 13, 1888), 164, describing article "Kashgar and the Passes of the Tian Shan Range," in *Revue d'Anthropologie*, 3rd Series (Paris, 1888), 111.
[33] Morgan, "Russian Geographical Work," in *PRGSM*, 9 (1887), 425–426.
[34] *Nature*, 37 (April 12, 1888), 566.
[35] *Nature*, 35 (January 13, 1887), 258–259.
[36] *Nature*, 33 (January 21, 1886), 281.

to Kashgar and British India. This plan proved unfeasible, and they finally managed to get to Osh, thence to the Alai Pass, to Taldyk, Karakol, and finally to Chitral. On their return to France they claimed to have been the first to cross the Pamirs. Obviously this was an exaggeration because several Russians had crossed the area, and Ney Elias had explored and described the region. In the rare air the travellers were often exhausted, and Capus measured their pulses during these periods and found them as high as 170 per minute.[37] On their return the Paris Geographical Society gave each a gold medal.[38] Bonvalot, in particular, nothing daunted by this initial failure, immediately began preparations for another expedition.[39]

The next English explorer to cross the Turkestan area did not have the significance of Carey's expedition, but it later came to have more public renown. Francis, later Sir Francis, Younghusband, was an explorer by birth. His father, Major General J. W. Younghusband, had crossed and recrossed the Sind Desert in the campaigns of the 1840's. When invalided home in 1856, he married Clara Jane Shaw, the sister of Robert Shaw, who already was an explorer of the Central Asian area. Of the five children all three sons served with distinction in the military service in the finest British tradition.[40]

After some service in India, Francis Younghusband moved to China for a time. When posted back to India, he decided to make of his return a journey of exploration by the overland route. The only European in his party, he set out from Pe-king on April 4, 1886 and proceeded to Kalgan, Kuku-khoto, and crossed the desert to Hami, which he reached in seventy days of travel. At Bortson Well he crossed the route of Przhevalski. From Pichan he then followed the Tien Shan Nan Lu route to Turfan, Karashahr, Ak-su, Uch-Turfan, and Kashgar. At Kashgar he rested while visiting with Russian Consul Petrovski and Belgian Missionary Henriques. Leaving Kashgar, then, he continued to Yarkand, which he reached on August 29. From there the route to India led him through the Tupa-davan (Pass), the Yangi-davan, the Chiragh Saldi Pass, the Tashkurgan Pass, then up the Yarkand River to Aghil-davan and Kashmir. He crossed the Himalayas at Mustagh Pass.[41] During this expedition he covered little unexplored ground, but

[37] *Nature*, 36 (October 20, 1887), 588–589.
[38] *Nature*, 38 (May 17, 1888), 66.
[39] *PRGSM*, 9 (1887), 307, 509. For a full account see Bonvalot, *Through the Heart of Asia.*
[40] Seaver, *Francis Younghusband, Explorer and Mystic.*
[41] *PM*, 34 (1888), 315; *Nature*, 38 (May 17, 1888), 65.

his feat was notable in that he succeeded in crossing the Turkestan area from an eastern starting point and reaching India. He also found a different location for the Kuruk Mountains from that given by Pievtsov, but the latter had travelled south from the Altai to see them, while Younghusband went between them. During the journey he made a few side trips, but they mostly covered the ground already reported on by Pievtsov, Przhevalski, Potanin, Carey, Kuropotkin, and Forsyth. His servant, Liu Chung Shan, returned to Pe-king and two years later made part of the trip again in the service of Rockhill.

Soon after this successful journey Younghusband and a companion Macartney started on another expedition over the Hindu Kush to the Indus Valley to explore the passes of the Hindu Kush and the Karakoram Ranges. At the same time this was also the aim of Grombechefski.[42] Younghusband passed the Karakoram and Mustagh, the Taghdumbash Pamir, and went over the Sin-shad Pass to Kunjut. In the Pamirs he met Captain Grombechefski, who had just been turned back by the Tibetans. In that trip Younghusband discovered two new passes, also reported by Colonel Woodhope.[43] After this, Younghusband went on to more successes and other explorations in other parts of the world, and he became so well known that twelve years later he was elected President of the Royal Geographical Society.

In 1890 William Woodville Rockhill, of the United States Legation at Pe-king, pursuing his study of the Tibetan language, people, and customs, set out from the Chinese capital to visit Tibet. He seems to have been the first explorer since Abbé Huc to prepare himself by studying the Tibetan language before setting out, and he found it of great value in his daily contacts. Since his purpose led him primarily to Tibet, his path only partially enters the area under discussion here; but his scholarly attitude and reports make his travel of value. Following the route Pekin-T'ai-yuan, Shi-an, Lan-chow Fu, he continued to the banks of the Koko-nor. He spent some time visiting about the convent of Kumbun and reported disappointment on his examination of the famous trees whose leaves reportedly bear the image of Tibetan letters or of the gods. Indeed, while the name Kum-bun, or "hundred thousand images", refers to that phenomenon, the Chinese indicate

[42] *PM*, 40 (1889), 277; *Nature*, 45 (February 11, 1892), 353–355.
[43] *PM*, 36 (1890), 57; Younghusband, "A Journey across Central Asia," in *PRGSM*, 10 (1888), 485–518; Younghusband, *The Heart of a Continent*, and *Among the Celestials*, quoted in *Athenaeum*, 1890.* In the discussion of Younghusband's paper (p. 518) President Strachey mentioned a Basevi who had lost his life exploring in Central Asia. I have no other information about this name.

their disbelief by using the name T'a-erh-ssu instead of Kum-bun. Friar Orozio della Penna in the 18th century gave it the name "Convent of the Dagoba". Rockhill fared better than previous travellers because of his knowledge of the language and because he was introduced as the translator of parts of the Kandjur, the sacred books, into English. This knowledge gave him high status among the Tibetans and unusually easy acceptance and tolerance.

From Kum-bun Rockhill continued via Tankar and Lusar. At Koko-nor he studied the area, particularly the island, called Lung-Ch'i-tao or "Dragon colts' Island" by the Chinese. Thence he turned south across the Tsaidam, with its Mongol population, some 4 to 16,000 persons, all still devout Buddhists. Once he reached Tibet, his path back to Shanghai via the Yang-tze lies outside the present study.[44]

Perhaps the most significant single name in the middle 19th century for the exploration of Central Asia is that of Nikolai Mikhailovich Przhevalski. With a scientific and military background, he began his explorations in 1872; and his death occurred soon after he had left on his fifth expedition. His explorations covered more miles than those of any other explorer until the time of Sven Hedin, and he was responsible for filling in many of the blanks on the maps that he used. For some reason the Tibetan capital of Lhasa attracted him, and nearly all of his expeditions had as their goal a visit to that forbidden city. He did not succeed.

Przhevalski came of a noble family and was born in 1837 in Smolensk. In 1855 he entered the army as a subaltern and served as an officer 1856–1857. Soon afterwards he withdrew from active service and taught in the *gymnasium* in Warsaw. Only then did he feel the call to take part in the explorations that thereafter absorbed his life.[45]

His first expedition started in Kiakhta in 1871, passed Urga and Kalgan in October, 1872, and went on to Pe-king, where he completed his preparations. The group then travelled west with Lhasa as the goal. Colonel Pievtsov, who was later to succeed the leader, and two Cossacks, made up the expedition. They moved west past Tolun-nor (Dolon-nor), Tolaï-nor, on to Si-insa, near Kuku-khoto, In-shan, to the Hoang-ho at Bautu, then across the Ordos Plateau to the Ala-shan. There they entered a Mongol principality called Vei-tchin-fou, with capital at Doun-iouan-in or Teng-yan-in. In Kan-su Province they passed Ta-chin, Te-tung-gol, and Ta-tung. Here they had to defend

[44] Rockhill, *The Land of the Lamas.*
[45] Obituary in *Nature*, 39 (November 8, 1888), 31–34.

themselves against an armed attack by a band of Tanguts. They then reached Koko-nor, crossed the Tsaidam to the Fortress of Prince Dzun-zasak (Djoun-sazak) with whom Przhevalski established friendly relations which helped him in later expeditions. In January, 1873 he reached the upper part of the Yang-tze, which the local Tibetans called Di-chou (Drechu). By then the condition of men and animals was such that he had to give up hope of reaching Lhasa and turn back. He returned via Ala-shan and the Gobi Desert to Kuldja in July, 1873. The expeditions had cost 6,000 rubles. Besides crossing the Gobi twice and reaching Koko-nor, it had brought back a rich zoological and botanical collection, including 300 plants, 85 mammalia skins (including four of the rare wild camel), 500 birds (180 kinds), 50 fish, 150 reptiles, and 2,000 insects.[46]

On his return Przhevalski wrote a book describing the trip. The book received wide acclaim and appeared in several translations.[47] The Geographical Society presented him its Constantine Medal, and other societies also awarded him medals.

In 1876 Przhevalski obtained from the Ministry of War 25,000 rubles, which enabled him to start the second expedition, again with the plan of reaching Lhasa from the north. The expedition consisted of Przhevalski, Eklon, and several Cossacks. Starting in July, 1876 from Kuldja, they crossed the Tien Shan, Kurla, Karashahr, the Kontché-daria, the Tarim Basin, then Lake Lob-Nor, whose existence had been seriously doubted. Przhevalski was the first European to see it in modern times, that is, since Marco Polo. On this expedition also he discovered the Altyn Tagh Range and noted for the first time the existence of a kind of wild horse. Finding no easy pass through the Altyn Tagh, he returned to Kuldja to reorganize the expedition for a more sustained effort. When he took up the journey again, he crossed Dzungaria and Ebi-nor to Guchen. There he contracted a skin disease of the steppes (*proritisscroti*) which compelled him to return. The following March he was ready to start out again for Lhasa, but frontier authorities turned him back, and he received a telegram from his government, ordering him to return because of the internal problems caused in China by the death of Yakub-Beg and the delicate relations between Russia and China over the occupation of Kuldja and the Tarbagatai.[48] He therefore returned to St. Petersburg in 1877 to write

[46] Deniker, "Explorations russes," 412; *PRGS*, 22 (1878), 51.
[47] Przhevalski, *Mongolia and the Land of the Tanguts*; *PRGS*, 22 (1878), 343.
[48] Morgan, "Prejevalsky's Journeys and Discoveries in Central Asia," in *PRGSM*,

his account of the expedition.[49] There he prepared for his next expedition.

On his third expedition, starting from Zaisan in 1879,[50] in company with Eklon, Roborovski, an interpreter, and eight Cossacks, Przhevalski proceeded to Ulun-ghur (which Rubroeck visited in 1253). He passed the Chinese fort of Bulan-thai at the mouth of the Urungu, then the Tien Shan, where he gave the north area the name of Desert of Dzungaria. He passed Bar-kul, Hami, and Su-chow, where he heard of the Caves of the Thousand Buddhas. He then pushed through the Nan Shan in July and discovered several new mountain chains. One he named Ritter and the other Humboldt. After a hazardous crossing of the Mechin-Ola Mountains by a 5,800-meter pass, during which he almost lost the Cossack Egorov, he reached the Tsaidam near Lake Kurlik. Here he visited with Prince Dzun-Zasak, then set out across the Burkhan-Buddha Chain, the Shuga Chain, and a new one which he called the Marco Polo Range. Here he found again the headwaters of the Yang-tze in a stream locally called Mur-uso (Mour-Ousso) by the Mongols.

After a brush with bandits, the expedition moved south across the Tang-la and actually reached Nap-chu, the headwater of the Salween, before Tibetan troops forced him to turn back. By then he was only 250 vërsts, some 144 miles, from Lhasa. An appeal for passage, sent directly to the Grand Lama by messenger, brought a new refusal. The expedition therefore turned back. The lateness of the season made it necessary for the group to winter in the mountains at an altitude of 16,000 feet, where they suffered severely from the cold. Then after some more exploring for the sources of the Yellow River the expedition returned north and to Russia. On his return Przhevalski was elected honorary member of the Russian Geographical Society, and the Emperor made a grant of 43,000 rubles to the Society to support another expedition.[51]

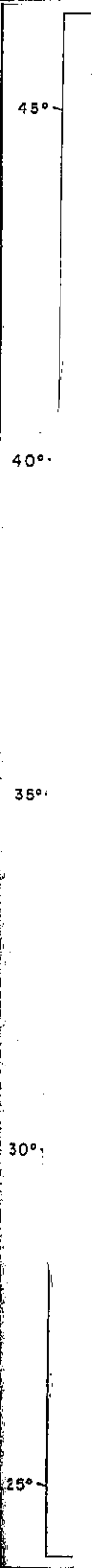
Przhevalski's Fourth Expedition, 1883–1885, consisting of the

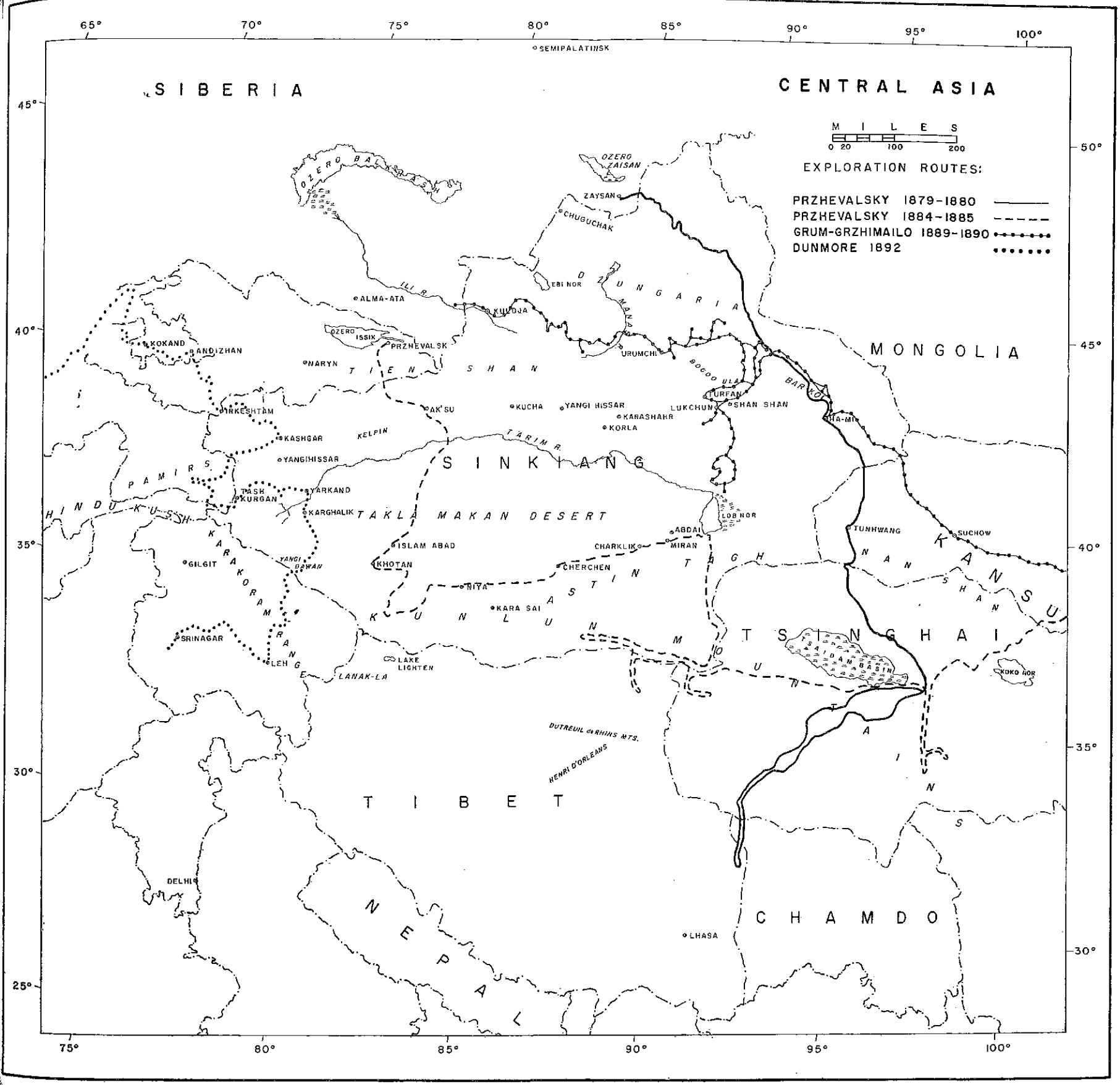
9 (1887), 213–232 and map; *PM*, 20 (1874), 41–49; *PM*, 24 (1878), 38; *PM*, 26 (1880), 235; *Nature*, 38 (May 17, 1888), 66.

[49] Przhevalski, *Ot Kuldji* . . . .

[50] A German scientist, Blumenfeld, started the same year to follow the same route and engage in botanical and geological explorations, but his itinerary is not clear – *Nature*, 19 (1879), 271.

[51] *Nature*, 39 (November 8, 1888), 33; *Nature*, 19 (February 6, 1879), 271, 323; *Nature*, 22 (May 13, 1880), 41; Deniker, "Explorations russes," 414. He travelled 14,700 miles, surveyed half of it, and collected 4,500 specimens of mammals and fish, 6,000 insects, and thousands of plants.

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OZERO ISSIK
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BARKOL
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KELPIN
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SINKIANG
PAMIR
TASH KURGAN
YARKAND
KARGHALIK
TAKLA MAKAN DESERT
LOB NOR
ABDAI
TUNHWANG
SUCHOW
HINDU KUSH
KARAKORAM
ISLAM ABAD
CHARKLIK
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leader, Roborovski, Kozlov, an interpreter, and seventeen Cossacks. Starting from Kiakhta and Urga, they crossed the Gobi to Ala-shan and Si-ning, then went on to Koko-Nor and Dzoun-zasak. Near the headwaters of the Hoang-ho again they had to fight to protect themselves from a Tangut band. Back in the Tsaidam the group crossed to the Nan-Shan and the Altyn Tagh, passed the Tugus-davan, then went from the Kun-lun back to Si-ning. In the middle of March, 1884 they left Kan-su for Koko-Nor and the Tsaidam, crossed the edge of Burkhan Buddha, and entered northern Tibet. There Przhevalski discovered a lake to which he gave the name "Unfreezing Lake." Near there also several bands of Tunguts, one of them 300 strong, threatened the expedition. The exploring party successfully avoided a prolonged clash in each case. They then followed the ancient route around the Altyn Tagh to the plain near Lob-Nor; then via Charklik and the base of the Kun-lun they reached Keriya. At Polu they tried to cross a pass into Tibet but were again repulsed by Tibetans. By then the expedition was exhausted and decided to return. They continued west to Khotan, then followed that river to Ak-su, crossing the Takla-Makan for the first time on record. They returned to Russia via Bedel Pass and Kara-kol.[52]

During the expedition Przhevalski gave names to a good many peaks of the Kun-lun Range as he passed, and he found and named the Columbus Range and the Burchan-buda Range (Burkhan Buddha). In each case he reported on buried cities whose remains he could see. On his return the explorer prepared a new map on the scale 70 miles to the inch for the Russian Geographical Society, showing the route along the Tarim to Lob-Nor, the watershed where the Lob-Nor depression ended eighty miles east of the Lake, and where the desert reaches an altitude of 3,700–4,800 feet and drains toward Lake Tchinjen-he. Thus he opposed Richthofen's proposal to include the Tarim depression and the Eastern Gobi in the same geographic region. The map showed the edge of the Kun-lun and the watershed that it forms toward the Tsaidam lowlands. It corrected some errors in other maps.

[52] *Nature*, 28 (June 21, 1883), 182; *Nature*, 33 (January 21, 1886), 283–284, summarizing a letter from Przhevalski, January 20, 1855, in *Izvestia* of the Russian Geographical Society;* *Nature*, 33 (March 18, 1886), 468; *PM*, 34 (1888), 57; Deniker, "Explorations russes"; Przhevalski to the Czarovitch, Chobsen, March 10, 1884, in *PRGSM*, 7 (1885), 167–168; *idem* to *idem*, Eastern Tsaidam, August 8, 1884, in *ibid.*, 169–172; *Science*, 2 (October 19, 1883), 547, summarizing *Comptes rendus, Société de Géographie*, June, 1883; Przhevalski, *Fourth Expedition.*

Przhevalski concluded that there was enough water in the Tarim River to navigate a steamboat.[53] He found the altitude of Lakes Jaring and Oring to be 14,000 feet. He verified Klaproth's and D'Anville's maps as accurate, whereas recent maps had shown a bend to the west in the Khotan-daria. He reported that the river's water reached the Tarim only in the summer. He discovered a new oasis, Tavel-kel, about 50 years old, with 500 families; but he could not find Yashil-Kul Lake where recent maps had shown it. He found 35 feet of water at the confluence of the Yarkand and Khotan rivers, width about 185 yards. In the summer it is three times that; so he concluded that it might be navigable from Lob-Nor to the confluence of the two rivers.

The success of these operations encouraged the Russians to undertake further explorations with certain advantages not available to the British or French. In discussing these problems later in the year, Colonel Sir Francis de Winton, after expressing regrets over the loss to the scientific world suffered by the death of Przhevalski, went on to describe some of this impetus: "Recent explorations by Grombechevski, Lidsky, and Grum-Grijmailo were in Pamirs and Hunza. Since the completion of the Trans-Caspian Railway to Samarkand a great impetus has been given to Russian trade in Central Asia even extending, by well-known routes, as far as the northwest provinces of China, where Russian goods are now found entering into competition with those of English manufacture." [54]

Przhevalski's fifth expedition was organized on a much larger scale with more people, a heavy Cossack guard, and several scientists. It included Bogdanovich (a surveyor and geologist), Lieutenant Roborovski, Teleskoff, Kozlov (who later made a real name for himself), M. L. Conradt (an entomologist from Königsberg), a taxidermist, and an interpreter. As the expedition was about to depart from one of the staging areas, Przhevalski suddenly died November 1, 1888. The Imperial Russian Geographical Society, rather than call off the expedition, decided to continue it in honor of the explorer. At the head they placed Colonel M. A. Pievtsov, who had already done some exploring in the Mongolia area and had accompanied Przhevalski in 1873.[55]

[53] *PM*, 29 (1883), 151; *PM*, 31 (1885), 65, 223, 269, 307, 395, 477; *PM*, 33 (1887), 56, 189; *PM*, 34 (1888), 57; *PM*, 36 (1890), 58; *Nature*, 37 (November 10, 1887), 38; Przhevalski, *From Kiakhta to the Sources* . . .

[54] Winton, "Geography," Opening Address by the President of Section E, British Association, Newcastle, 1889, in *Scientific American Supplement* No. 729, 28 (December 21, 1889), 11652.

[55] *PM*, 34 (1888), 57.

On March 28, 1889 an imperial ukase ordered that the city of Karakol, where Przhevalski died, thereafter bear the name Przhevalsk.[56]

The expedition dropped Lhasa from its goals and decided to concentrate on Eastern Turkestan and Northwest Tibet.[57] The main body of the expedition started from the town of Przhevalsk on the 14th of May, 1889, passed Issyk Kul, Barskaun Pass, Zaúke Pass, Taushkan-daria, Kashka Pass, and Bedel Pass into the Turkestan through the narrow gorge of Kara-teke Ridge, which in some places is only thirty to thirty-five feet wide but has walls 700 feet high. The first Kashgarian village reached was Kalpyin, whence the travellers went on to Yarkand. They reported that the Kashgar-daria no longer reached the Yarkand-daria but was lost in irrigation canals in Maral-bashi.

The expedition followed the Yarkand River and reported that it rolled a mass of muddy water between flat banks. Thickets of *Populus euphratica, populus prunosa,* tamarisks, *Helostachus,* shrubs, and rushes covered the banks for some fifteen to thirty miles on both sides of the river. Sand deserts spread towards the west to Kashgar and eastwards to Lob-Nor. In the deserts the explorers discovered many ruins of old cities, which were rarely visited by the local inhabitants. They also examined the Akka-tagh Range and named it the Przhevalski Range. They studied the Altyn-Tagh and northern Kun-lun, the Yarkand Valley, the Niya-to-Cherchen route, the Konche-daria, and Lake Bagrach-Kul.

From Yarkand the expedition went south towards the hilly tracts, where it stayed for a month; then it moved toward Khotan, whence Colonel Roborovski wrote on October 7 that he proposed to winter at Niya and to search for a pass to Tibet and the border ridge to which Przhevalski had given the name of Russian Ridge. If they succeeded, they intended to spend the next summer in Tibet.[58]

They then moved to the Khotan high road and to northern spurs of the Kun-lun. Here at 10,000 feet they stayed forty days at Tokhta-khon, collecting birds and plants. Geologist Bogdanovich studied the region from Tisnab to the Yarkand River. September 13 they left the highlands and in three weeks reached the Khotan oasis (120,000 population); then they went on to Keriya and Niya, where they left superfluous

[56] *PM*, 35 (1889), 181; *Nature*, 40 (May 16, 1889), 65.

[57] *Nature*, 40 (May 16, 1888), 65. The expedition retained the name "Tibetan Expedition" – Deniker, "Explorations russes," 416.

[58] *Nature*, 41 (January 6, 1890), 234.

baggage and started to explore the Kun-lun for a good pass to Tibet. They found it at the sources of the Tillan-Kyzyl near the Min-jibin Khanum monastery. After spending the winter in Niya, they resumed exploring on May 7 the next year.

Roborovski and two men went up the Saryk-Tuz Pass, discovered during the fall, and reached the sources of the Keriya River on the Tibetan Plateau, 6,506 feet high. Soon they had to return to Kara-sai for food for their horses. Then they again tried to penetrate the pass, but had to return.

Kozlov meantime followed the Bostan-Tograk River for 100 miles and passed Lake Dashi-Kul, but he had to go back. The next attempt was made by all three explorers, four other Russians, and a few natives. They went up Ak-su River to a 15,000 foot plateau, where in July they experienced terrible snowstorms. They had to return to Kara-sai to recuperate. They then set out for Tcher-Tchen [Cherchen]. At Atchan they met Bogdanovich, who had investigated the geology of the Saryk-Oz and Ak-su. When the horses recovered, they crossed the Kun-lun via Muzluk Pass and divided: Roborovski went southeast; Pievtsov went south up the Uluk-su, which is the source of the Cherchen-daria. He came to an immense chalky ridge 20,000 feet high. He stopped at Lake Yashil-kul. There the natives were engaged in gold mining.

From Yashil-kul the party started back via the Mendalyk, Lob-Nor, up the Yarkand-daria to Korla (4,000 feet), past Karashahr and Urumchi, and to the frontier. On January 15, 1891 they entered the Russian post at Zaisan.

The meeting with Bogdanovich brought the party together for the first time since they left Przhevalsk. He had taken charge of one section of the expedition to detour by way of the western Tien Shan and Kashgar. Moving south from the point of departure, he reached Chatyr May 13, 1889, visited the Aksai wells, and went on to Turugart Pass and Kashgar. There he gathered many geological specimens. He planned to move south by the valley route to survey the Mustagh-Ata, but heavy rain and snow made that trip impossible. Instead he proceeded to Yangi-Hissar and Kara-tash Pass and explored the eastern part of the Mustagh Ata Range at a height of some 26,000 feet. He spent one month in Yarkand awaiting the arrival of the rest of the expedition with Pievtsov and then joined him.[59]

[59] *PM*, 35 (1889), 294.

In the meantime Captain Grombechevski, having been sent out to explore the Khanate of Kanjut in the highlands between India and Afghanistan was for a time supposed to have been lost. Actually he reached the sources of the Amu-daria, and thence proceeded to the Ak-baital River. On August 16 he crossed the high ridge on the frontier of Afghanistan. On the southern slope of this ridge the expedition was overtaken by a violent snowstorm, during which Grombechevki's Cossacks succeeded in getting hold of two members of the party. From them they learned that the expedition was surrounded by Afghan troops who had been sent to take them prisoner. Consequently Grombechevski, not withstanding the snowstorm which still raged about them, crossed the mountains again and returned to the Pamirs, whence he immediately went across the Hindu Kush and through a mountain pass that led to Kanjut. The journey was so difficult that the expedition lost one half of its horses and part of its baggage. Circumstances did not permit Grombechevski to stay at Kanjut. He recrossed the Hindu-Kush and entered east Turkestan at the sources of the Rasken-daria, one of the affluents of the Yarkand River. He followed its course, hoping to reach Karakoram but was soon compelled to abandon his scheme and only explored the nephrite mines on the banks of the river. After surveying part of the Rasken and Yarkand Rivers, the Karakash Valley, Taldat, and the vicinity of Khotan, the expedition returned to Little Kara-Kul Lake on the Pamir and reached Kashgar on November 13.

Three weeks later, after some exploration of the Kizil-su and the eastern Kashgarian Range, they were at Osh, bringing with them a mass of interesting information and numbers of photographic views of the region they had explored.[60]

The main party of Kozlov's expedition, in the meantime, had continued to Yarkand, which it reached July 2, then to Khotan on October 7. It went into winter quarters at Niya.[61] From Niya Pievtsov planned to make a serious effort to enter Tibet.[62]

A special note needs to be added for Grombechevski. After he set out alone in May, 1889, he passed Marghilan July 1, 1889, entered the Hindu Kush, and reached the Taghdumbash, where he met two

[60] *Nature*, 40 (September 12, 1888), 483; Deniker, "Explorations russes," 428.
[61] Vsevolod Roborovski, Letter, August 4, 1887, "Progress of the Russian Expedition to Central Asia," in *PRGSM*, 12 (1890), 19–36, Translated from *Russian Invalide*, October 11 (23), 1889;* *PRGSM*, 12 (1890), 38–39.
[62] Roborovski, Letter, Niya, November 29, 1889, in *PRGSM*, 12 (1891), 161–166; *idem*, Letter, Kara-Sai, July 9, 1890, in *PRGSM*, 13 (1891), 99–105.

Englishmen, Bower and Cumberland. He proceeded to the edge of Mustagh Ata again. There the party encountered another explorer from India, Captain Younghusband, on his second expedition. From that point they explored the upper course of the Rasken-daria and reached Karakoram Pass. Turning back at that pass, they attempted to return to the main expedition by going through Polu. The venture proved too taxing. Both men and horses became sick from the high altitude. They finally left some baggage behind and turned back as far as Shahidulla on the Karakash River, where they hired some Kirghiz to fetch their abandoned baggage. They lost twenty horses on that venture, but then they reached Kilian and went on to Khotan. There they met Bogdanovich, who was preparing to assail the Tibetan highland over the Kun-lun.[63]

Joining forces in May, 1890, they pushed on to Polu, but there the Chinese officers refused to allow anyone to sell supplies to the expedition. They finally found a willing guide and crossed the Kun-lun into Tibet as far as Lubashi Pass and Lake Gugurtlik. In spite of the season the coating of snow, ice, and the cold weather combined to prove too much for the small expedition. Then their meager supplies threatened to run out. The party could go no further but had to give up the attempt and return to Kashgar and to Osh via the Kizil Art Pass.[64] On the way, at Yarkand, they again encountered Captain Younghusband engaged in his own explorations.

Colonel Pievtsov himself, with the rest of the expedition, tried to cross the Kun-lun into Tibet by crossing the mountains south of Khotan; but he, too, found it impossible and had to give up the idea. The expedition then returned via Urumchi, Manas, Telli-nor, Zaisan, Osh, and St. Petersburg.[65]

The expedition ended in January, 1891 with an impressive sum of geographical achievements, although they had not realized the old dream of Przhevalski, reaching Lhasa. They had made topographical surveys of 5,000 miles of terrain; they had established fifty geographical positions and made magnetic observations of ten points; they had gathered botanical, zoological, and geological specimens sufficient to load forty camels. They had failed to penetrate Tibet because of the

[63] *PRGSM*, 12 (1890), 422–423, 466–467.
[64] Sir Montstuart E. Grant Duff, Address, in *PRGSM*, 13 (1891), 383–384; L. Conradt, paper read before the Geographical Society of Berlin, March 7, 1891, summary in *PRGSM*, 13 (1891), 236–238.
[65] *PRGSM*, 13 (1891), 180–181; *GJ*, 9 (1897), 546–553; Deniker, "Explorations russes," 416.

exhaustion of their equipment and supplies. This time they had plenty of guards and plenty of ammunition, which they hardly needed, but they were short of money.[66]

In his summary of the accomplishments of the expedition, Bogdanovich listed the other travellers in Chinese Turkestan in recent times as follows:

	English and Indian:		*Russian:*
		1713	Trushnikof
		1780	Yefrémev
1812	Mir Izzet Ullah		
1848	Thomson		
1854–58	Hermann Schlagintweit	1858	Valikhanov
1864	Pundit Mohammed Hamid		
1865	Johnson		
	Pundit Nain Singh		
1868–69	Robert Shaw		
	Hayward		
1870	Henderson		
		1872	Kaulbars
1873	Forsyth Mission		
	Pundit Nain Singh		
		1876	Kuropatkin
		1878	Przhevalski
1885	Carey and Dalgleish	1885	Przhevalski
		1886	Grum Grijimailo
1887	Ney Elias	1887	Grombechevski
	Younghusband		
		1890	Grombechevski [67]

However, specific data is lacking for several of these names, and Bogdanovich evidently knew of several others not entered in his list. It is noteworthy that besides Bogdanovich, Schlagintweit and Dr. Stoliczka were nearly the only travellers who had had advanced training in geology, and neither of them returned.

With the conclusion of this expedition a change in emphasis appeared in the travels. Up to this time the collection of geological and biological specimens and the outlining of the mountains and valleys and establish-

[66] *PRGSM*, 13 (1891), 180–181; *Nature*, 45 (November 12, 1891), 45.
[67] *GJ*, 2 (1893), 57.

ment of accurate locations for important features were the main, although by no means exclusive, goals. By 1888, however, the bold lines of the maps were rather definite; and new problems won pre-eminence. The next twenty-five years saw an emphasis on the minutiae of the exploration. Geologists hacked at the rocks, glaciologists measured the drip of the glaciers; botanists collected more specimens, and archaeologists dug in the sands for signs of the past.

V – THE ARCHAEOLOGICAL PERIOD: 1888 TO STEIN'S FIRST EXPEDITION

Although Przhevalski's fifth expedition in numbers and length of stay was epoch-making, other expeditions that same year contributed significantly to the study of Central Asia.

G. E. Grum Grzhimailo was one of the most important of these. He had already done much exploring in the west. In 1884–1885 he had gone on two trips of exploration to parts of Russian Turkestan. In 1886 he passed through Kugart, Naryn, Chatir-Kul, Kashgar, Kizil-su, and Alaï in search of fauna. In April, 1888 he set out on his fourth expedition with the partial financial aid of Grand Duke Nicolas Mihailovich and Prince Cheremetev. He and his brother started on an expedition with the idea of connecting the line of exploration of Przhevalski and Potanin in Mongolia and the Tarim Basin by crossing the Tien Shan to Turfan, the Lob-Nor, the Altyn Tagh, and return.[1]

The expedition consisted of the two brothers, a collector, six Cossacks, and two helpers, with baggage carried on fifty horses and donkeys. They crossed the Russian frontier June 8, 1888, moving from Jarkent to Kuldja, which they used as the point of departure on July 3, 1889. Passing via Atschal or Tsitery, from which they could see Ebi-Nor, they crossed to Dshin-cho, the Chutuk Bai River, and Urumchi, where they found that on their maps the mountains were running the wrong way. From Mengete Pass they went on to the Kash Basin and discovered the Dos Mögen ora, then Khorgos, Ulan-Ussu, and Chusta Rivers. These mountains were not visible from Kash or Yuldus because their view was cut off by the Keldyn Mountains. Between Atschal and Urumchi the Mountains formed a wall the expedition could not scale, though they did find coal and gold mines about Urumchi. In this eastern part of the Tien Shan or Boro-Khoro, they also noted especially numerous varieties of vertebrate animals but found the area poorer than the Pamirs in birds and insects.[2]

[1] *PM*, 35 (1889), 181; *Nature*, 40 (May 16, 1889), 65.
[2] *PM*, 36 (1890), 252; Deniker, "Explorations russes," 422–423.

The expedition left Bogdo-Ola for Guchen. Here they ventured into the Dzungarian desert in search of the *Equus przewalski* and after great effort managed to bag two specimens. They then passed through Builuk-davan, across Kok-yar River, and along the Tuz-tau Mountains to Turfan. Along the route they noticed smoke issuing from fissures in the ground, baked mud, hot soil, and other signs of volcanic activity. They then explored the Luk-chun area. Their most surprising discovery was the strange activity of the barometer which south of Turfan registered 170 feet below sea level! Later studies by Roborovski confirmed this discovery, hence the name Turfan Depression.

From Turfan they crossed the Choltau Mountains to the south, intending to reach Lob-Nor, but they had to turn back at the Tiuge-Tau Mountains. On their return to Pichan they made a side trip to Jan Bulak, then along the south slope of the mountains to Hami, which they reached January 16, 1890.

From Hami they crossed the Gobi to Su-chow, then Lan-chow and Yun-chan. They branched off to Si-ning and the Hoang-ho, then south to Szechwan, where, like Przhevalski, they were stopped by Chinese authorities.[3] They returned to Koko-Nor and Su-chow, Kuldja, and Tashkent by the post road.[4] On November 25, 1890 they crossed the Russian frontier again.

During this trip they paid attention to geological formations and zoological specimens, of which they made a large collection, some 14,000 items. The botanical collection was smaller. In all they travelled 1,417 miles that had not been reported on before; they determined 19 astronomical positions, and they fixed 51 heights hypometrically and trigonometrically.[5] They had surveyed 4,840 miles, 4,000 of them new ground. They had taken 200 photographs. On their return through Dzungaria they got four new specimens of Przhevalski's horse. In September they entered the Tien Shan again and explored the eastern end and the Turfan Oasis, where they examined the underground canal system. Establishing that the surface level was not over 200 or 300 feet below sea level, they estimated that it had earlier been the bottom of a great lake.[6]

The Grzhimailo brothers were more interested in and trained in the

[3] *PM*, 36 (1890), 301.
[4] Morgan, "Expedition of the Brothers Grjimailo"; *PRGSM*, 12 (1890), 616.
[5] Morgan, "Expedition of the Brothers Grjimailo," and review by P. K. in *Nature*, 54 (August 27, 1896), 388–389.
[6] *Nature*, 43 (April 16, 1891), 571; *La Nature*, 28, part 2, (1900), 15.

history of Central Asia, and their report reviewed the history from bibliographical sources.[7]

During the early explorations of Chinese Turkestan Przhevalski had collected specimens of a type of wild horse which had not been previously described. His report on the horse led to wide publicity. The horse, after due study, was acknowledged as a new species, and it received the name *equus prjewalski* or more popularly, *Przhevalski's Horse*. In those days when Darwinian theories were new and amateur scientists were looking for new applications, this discovery gave them a fine opportunity to see in these wild horses the original horse from which others had descended. The publicity given these wild horses attracted the attention of the circus nabob Carl Hagenbeck and set off one of his most spectacular searches. The Duke of Bedford suggested to him that the wild horses should be in his circus, and Hagenbeck dispatched William Grieger, one of his most experienced travellers, to bring Przhevalski's horse to his circus.

This elusive horse had defied all attempts at capture or transportation until then. Only one person, the naturalist Falz-Fein, had managed to bring a few live specimens to his estate in the Crimea. Because of the naturalist's secretiveness about the provenience of the horses, Grieger could get little information from Falz-Fein about the best way to approach the hunt. Grieger travelled first to Germany, then to South Russia for interviews, then back to St. Petersburg. By roundabout means he found out that Falz-Fein had caught his specimens in the area north of Kobdo. Grieger obtained letters from the Russian Government and the Chinese Ambassador and from the Buddhist Lama in St. Petersburg, Dr. Radmai; and there he outfitted his expedition. The expedition set out in the midwinter so that they could be on the spot by spring when the young foals began to appear.

Grieger and his one assistant travelled via Moscow to the Ob, on the Trans-Siberian Railway. Then he went by sled 170 miles south to Biisk, near the Altai. From there he still had 600 miles to go to reach Kobdo, riding on horses and camels in an intense cold, where the temperature fell to —50° F. Fortunately, despite the personal suffering, Grieger reached Kobdo before the foaling season and had time to study the area while he waited. He studied the native population, dress, habits, and living conditions. Kobdo was then a town of only 1,500 inhabitants. Its chief reason for existence was political administration, some trade in imported goods, and prominence as a

[7] Grum-Grjimailo, *Description of a Journey to West China*.

stopping place for caravans. The people, he found, were three-quarters Moslem Tartars and the rest were Chinese. He had live in a tent and subsist on a monotonous diet of mutton and *tsamba* (powdered tea, salt, and sheep or goat butter) and *arka* (residue of evaporated milk). He found plenty of trout in the streams, but the natives considered fish an unclean food, like snakes. He also made a collection of birds and found a variety of hitherto unknown pheasant.

Gradually, as spring came on, Grieger collected a hunting party. The natives were not accustomed to hunting for the purpose of capture, and Grieger had to give them his own instructions. The method he used was quite simple. They slipped up on resting groups of the horses, then shouted them into flight. They then pursued the animals on horseback. When foals became too tired to keep up, they would fall back and could be picked up off the ground. The hunters returned the infant captives to their camp and introduced them to suckling mares. They readily transferred their affections to the mares.

The natives found the new sport so attractive that they continued it on their own, and Grieger soon had on hand some 30 foals, though his orders only called for six. He had to travel one thousand miles to a telegraph office to ask for instructions, an absence of three weeks. Finally he set out with 52 foals. Many of them died on the way back, as was expected. It took eleven months to get the herd back to Hamburg, and Grieger finally delivered 28 animals.[8] With good publicity these animals became the stars of circuses and zoos, but their glamor soon faded when they turned out to be less exotic than supposed.

A few years later Hagenbeck sent two expeditions to Kobdo to procure the Argoli or wild sheep, also called the *Ovis Poli* after the traveller Marco Polo, who first reported them. Hagenbeck hoped to cross the Argoli with domestic sheep. Details of the expedition are lacking, but the efforts were unsuccessful. At a cost of 5,000 pounds the agents caught sixty animals, but all of them died of diarrhoea on the way back.[9]

In 1889 Gabriel Bonvalot, whose first exploration in Central Asia had not been very successful, joined Prince Henri d'Orléans, eldest son of the Duc de Chartres, on a trip across Chinese Turkestan.[10] Leaving Paris July 6, 1889, they organized their party at Jarkent

[8] Richard Lewisohn, *Animals, Men, and Myths* (translated from the German) (New York, Harper & Brothers, 1954).
[9] Hagenbeck, *Beasts and Men*, 73–89; *GJ*, 13 (1899), 658.
[10] *PM*, 36 (1890), 58; *Comptes rendus, Société géographique de Paris* (1889), 386.

and during a 6-day stay at Kuldja. Here they added Father Dedékens (de Decken), a Belgian missionary, to the party as interpreter. He was of special help because he knew Chinese. He had long been in Kuldja and had travelled extensively in the Chinese Empire. They took along as servant Parpi Baï, who had already worked for Dutreuil de Rhins. They left Kuldja September 12, 1889, intending to visit Lob-Nor and then continue to North-east Tibet. Crossing the Tien Shan, they reached Korla, where Bonvalot had hired a number of camels.

They reached Yuldus October 10, 1889, then followed the Kash River to Tsakma, and leaving Yuldus, continued to Khaidu-gol and Karashahr, which they soon left en route to Lob-Nor. They had some difficulty with local authorities et Karashahr and Korla, but finally they got away and reached Lob-Nor in November.[11] Here they reorganized the caravan and took on a 6-months supply of food. From Lob-Nor they went on across the Altyn-tagh, the Chimen-tagh, and the Columbus Ranges to Tachien-lu in Western China,[12] then followed the Mekong River and Red River to Tonkin. The expedition brought back a collection mostly of zoological specimens.[13]

Also in the summer of 1889 a French merchant in Kashmir, Dauvergne, started from Ladak in company of Major Cumberland and Lieutenant Bower.[14] They crossed the Kilian Pass to East Turkestan, crossed the Pamirs, and reached the upper course of the Oxus.[15] When they reached Kashgar territory, Dauvergne left the others and turned west to reach Zarafshan or the Yarkand River. At Ak-Masjid he met a party from the Pievtsov Expedition (Przhevalski's Fifth Expedition) led by Grombechevski. He then continued to Sari-kol and Taghdumbash, explored the Tung Valley, and found that the Tung is a tributary of the Tashkurgan. He then went on to the valley of the Kara-chunkar; but when he had difficulty persuading the Afghans to admit him, he turned back.[16]

Colonel Mark S. Bell, in a trip parallel to that of Younghusband, also travelled through the Turkestan area in 1887. His itinerary ran

[11] *PRGSM*, 12 (1890), 98, 175, 234–236 (reporting a letter by Bonvalot, Charklik, November 15, 1890?, published in the *Journal des débats*).*
[12] *PRGSM*, 12 (1890), 45, 467.
[13] *PRGSM*, 13 (1891), 385; Gaston Tissandier, "Voyage dans l'Asie Centrale de M. G. Bonvalot et du Prince Henri d'Orléans," in *La Nature*, 19, part 1 (1890), 151–155 and map; *AG*, 10 (1901), 463.
[14] *PRGSM*, 12 (1890), 45.
[15] *PM*, 36 (1890), 57.
[16] Walker, "Notes on Dauvergne's Travels"; Dauvergne, "Explorations dans l'Asie Centrale."

from Pe-king to Lan-chow, Ngan-si-chau, Barkul, Guchen, Urumchi, Toksun, Karashahr, Korla, Ak-su, and Kashgar, thence south to India. He was principally interested in studying trade routes, but he made detailed notes on climate, transportation facilities, and customs along the route.[17]

Another of the many operations in Chinese Turkestan in 1888 and one of the utmost importance was that of Captain Bower. In 1888 he obtained a year's leave and joined Major Cumberland, who was preparing a hunting expedition to the Pamirs. They did not leave Kashmir until June 22, 1889. At Leh they added Dauvergne, who planned to erect a small monument at the site of Dalgleish's murder. Captain Ramsay, British Joint Commissioner, required them to sign an agreement not to enter the dangerous Kunjut territory.

Their caravan had fifteen ponies, besides the Dauvergne equipment. They left Leh July 27 and crossed the Khardung Pass and went on to the Karakoram Pass, then Shahidulla and the Valley of the Karakash River, and the Kilian Pass. At Ak-Masjid they encountered a Russian party of the Pievtsov Expedition, with an escort of 25 Cossacks. They continued to Arpatalla Pass and Sari-kol, then Taghdumbash. At Tashkurgan they received a request from Captain Younghusband asking them to wait until he could join them. They then continued to Yarkand.

In Yarkand one day Captain Bower met a messenger who delivered to him a letter from Captain Ramsey. It ordered him to find and arrest Dad Mohammed, the murderer of Dalgleish. After some search Bower found a Hindu trader who was sympathetic to the enterprise. He even furnished his brother and several other men to aid in the search. Then Bower set out for Kashgar. There he gave written orders to his companions, whom he sent in different directions, to continue the search. He set out for Ak-su himself. There he had trouble with the Chinese but found nothing of the murderer. He continued to Kuchar, then Shahyar, where he met Major Cumberland. Major Cumberland had followed the Yarkand River. Then Bower continued to Kuchar; there he remained a while, inquiring about the criminal. One day during

[17] *PM*, 36 (1890), 134; *PRGSM*, 12 (1890), 379–380; Bell, "The Great Central Asian Trade Route . . .". Another companion of Younghusband was Lieutenant G. C. Davison, who took advantage of a two-months leave to try to reach the Mustagh-Ata with very meager resources but abundant pluck. He travelled north to Yarkand and then west in search of the mountain. He failed to reach Mustagh-Ata, but he met Younghusband in Kashgar, and later they travelled together in the Pamirs – *GJ*, 2 (1893), 549–551.

this sojourn a Turki visitor told him of a buried city nearby, adding that his friend had looked for buried treasure there but had found nothing but an old book. When Bower asked to see the book, he found it to consist of sheets of birch bark covered with Sanskrit writing and held together by two boards. His curiosity was aroused, and he prevailed on the Turki to take him to the site, which the guide did with reluctance, insisting that his fellow citizens would kill him if he took an European there. Bower examined the ruins of an old city, with rotted posts and traces of buildings, but he found little else except a cave with deserted niches on the sides.

The book, when taken to India, turned out to be one of the most significant discoveries of the century in Central Asia. It is the famous Bower Manuscript,[18] one of the oldest extant books, dating from the 5th century A.D. Written in Sanskrit in the Brahmi alphabet, it opened the way to a whole new field of linguistics.[19]

Bower, in the meantime, returned to Kashgar. There he found news of his two Hindu aides whom he had sent out with letters of instructions. They had reached Samarkand and had seen Dad Mohammed in the bazaar. One of them appealed to the governor, while the other followed the murderer. The governor immediately had him arrested. While Dad Mohammed was awaiting extradition, his bravado failed him, and he committed suicide. Then, despite the threats which his brother made to take revenge on Bower, the latter returned to Simla August 16, 1890 with his manuscript. This last item was immediately seized upon by Dr. Rudolph Hoernle, an Indologist in India, who began the study of the alphabet and the language.[20]

This trip, more than any other, later excited the curiosity of and led to the first of the expeditions by Dr. Mark Aurel Stein.

E. Blanc was given a mission by the French government to study Trans-Caspian railways and products of Russian trade in Turkestan. He set out from Ferghana October 23, 1890, crossed the Terek-davan, and entered the basin of the Kok-su and Tarim Rivers. He finally reached Kashgar November 9. In Kashgar he visited Younghusband in his winter quarters. His return route lay via the Taldek

[18] Hoernle, *The Bower Manuscript*.

[19] W. Geiger, *Die archaeologischen und literarischen Funde in Chinesisch Turkestan und ihre Bedeutung für die orientalistische Wissenschaft*. Prorektorats-Programm Erlangen, 1912.

[20] Bower, "A Trip to Turkistan"; *Nature*, 46 (August 18, 1892), 370, from *London Times* (date?). He later visited Tibet – *Nature*, 47 (February 23, 1893), 400.

and Kizil Beg Mountains, Lake Issyk-Kul, and the Chu River. Along the way he spent some time studying the geology of the Amu-daria.[21] In Tashkent he met the Grum-Grzhimailo Brothers, with whom he compared notes.

The Dutreuil de Rhins Expedition also started in 1890. J.-L. Dutreuil de Rhins, after long service as a naval officer, had done a considerable amount of valuable cartographic work in Indo-China, had served as journalist in Egypt during the Arab revolt of 1882, and had accompanied Brazza in the exploration of Africa. A few years earlier he had turned his attention to Central Asia and had published a large cartographic work of the area. This interest naturally led to a desire to visit the area itself.[22] In organizing this expedition, he was joined by Grenard, also a scientist and orientalist. Charged with a mission by the Minister of Public Instruction, they left Paris in February, 1890 and reached Tashkent April 7, 1890. They went on to Osh May 23, and twelve days later they departed for Kashgar with a small Cossack escort furnished by the Russian authorities and a servant, Parpi Baï. They planned to spend the winter in Khotan.

When they reached Khotan, they again established the location by astronomical reckoning and made several side trips to the south, exploring the slopes of the Kun-lun and fixing their astronomical location.[23] They then went on to Niya, where they suffered a great deal from the cold winter and lost a good many of their horses and asses.[24] However, at Keriya and Cherchen they inquired after and presumably found a pass over the mountains into Tibet. This was the route discovered by Pievtsov in 1890.[25] At each step they seem to have picked up invaluable manuscripts and relics of the past. They crossed the mountains by an easy pass and entered Tibet. There they explored the Tengri-Nor and the headwaters of the Mekong and the Yang-tze. Grenard claimed that they found the sources of both.[26]

In June, 1893 the leader, Dutreuils de Rhins, was murdered. Conflicting stories reported this event. The first report, by Grenard himself, said that when the expedition reached Ton-Buddha on the Yang-

[21] *PRGSM*, 13 (1891), 123, 180, 226 (quoting letter by Blanc, Tashkent, December 22, 1890 in *Comptes rendus, Société de géographie* No. 5, 1891).*
[22] *AG*, 4 (1894–1895).
[23] *AG*, 2 (1892–1893), 392–393.
[24] *PRGSM*, 13 (1891), 561, 725; 14 (1892), 238; *AG*, 2 (1893), 392–393.
[25] *GJ*, 3 (1894), 58; 14 (1899), 91, 442–443.
[26] Fernand Grenard, Letter from Si-ning, July 26, 1894 in *GJ*, 4 (1894), 573–574 (reporting a summary published in the *Journal des débats*).

tze, they met the first unfriendly Tibetans. On June 4 they were fired upon near some houses, and Dutreuils de Rhins was wounded in the stomach. While Grenard was going to the caravan for a litter, 200 Tibetans charged the group, plundered the caravan, drove the Europeans away, then tied the hands and feet of the wounded man, and threw him in the river. Grenard went to local Chinese officials and got no help, though the local lama did sympathize and even threatened to lead a punitive raid on Ton-Buddha. Receiving no practical help, Grenard proceeded to Si-ning, where he set up a temporary headquarters.[27]

However, one of the Cossacks in the expedition, Razumoff, returned to Kashgar with several articles belonging to the expedition. He was interrogated on the incident and told more of the details. He said the expedition reached Ton-Buddha on a rainy day, and that Dutreuils de Rhins, when refused admittance to one of the houses, ordered the Cossacks to break down the door. Then they entered the courtyard and camped there. The next day two horses were stolen, and Dutreuils de Rhins seized two local horses in return. Then, when the expedition started to leave, the inhabitants began firing on them and wounded Rhins in the stomach. The Cossacks were then separated and saw nothing more of the expedition. Another member of the expedition, Interpreter Mohammed Isa, also reached Kashgar and told of his search for a Kalmuck interpreter, and the fight during his absence. He also reported the story told him later by the Kalmucks (not Tibetans!), that the body had been tied and carried to the Yang-tze River seven miles away and thrown in. Then the Kalmucks divided the loot, throwing away all books, manuscripts, and instruments. The cook, also in Kashgar, added that Dutreuils de Rhins had antagonized the local inhabitants by paying them with Khotan gold rather than local valuta.[28] Another story reported later was that Dutreuils de Rhins had threatened to cut off the ears of the local official if his stolen horses were not returned.[29]

[27] *Ibid.*; *AG*, 4 (1894–1895), 109–111.
[28] *GJ*, 4 (1895), 380–381.
[29] The stories from Kashgar did not reflect very creditably on the leaders of the expedition; and when they reached print and Grenard reached Western Europe, he felt compelled to defend his part. He therefore communicated with two Belgian missionaries, M. and Madame Rijnhart, who were in the area, and asked them to verify the story by local inquiry. Their answer as reported substantially supported Grenard's original report – Grenard to The Royal Geographical Society, Paris, August 4, 1899, in *GJ*, 14 (1899), 328.

Despite these stories it is clear that Grenard did in fact recover some of the property, particularly the manuscripts and the one thousand photographs taken along the way. Important manuscripts they were, as was later found when they were published in French periodicals: documents in Brahmi and Kharoṣṭhi alphabets going back to the 6th and 7th centuries A.D. But this was not the end. A Swedish explorer, Sven Hedin, who had been exploring in Iran and was at the time in Kashgar, decided to make it a part of his business to investigate the incident further. Thus the death of Dutreuils de Rhins in part led to the fruitful series of travels by Hedin.[30]

Dr. J. Troll in 1892 set out on an exploring journey in Central Asia and reached Samarkand in October, intending to travel through Russian and Chinese Turkestan to find and study the ruins of Karakorum, returning by Pe-king and Shanghai. No further notice is available as to whether he really entered the area.[31]

The Russian Government set up a fund of 30,000 rubles in 1892 for another expedition to Eastern Tibet and Sze-chuan, under the leadership of G. N. Potanin and including on its staff Captain Roborovski and other scientists. This was to be Potanin's fourth expedition, but it falls outside the field of this work; besides, it had no sooner started than the death of Madame Potanin interrupted it.[32]

The next of the several expeditions starting in 1892 was that of the Earl of Dunmore. He started from Leh, accompanied by Major Roche of the 3rd Dragoons Guards, on a year's leave of absence. The expedition consisted of 56 ponies, plus seventy yaks for the higher passes, and 30 attendants (Arguns), some of whom had travelled with Bower and Younghusband. They passed the Kardung Pass June 23, which was far earlier than it usually was open. July 9 they passed the Karakoram Pass and struck the Yarkand River, the Suget Pass, and then followed the Karakash River to the Boschut Defile and the Grim Pass. Descending along the Sanju River, in August they finally reached Yarkand, an estimated 790 miles from Kashmir.

Turning west, on August 22 they reached the Kara-davan, then the Kiaz River and Sari-kol, Tashkurgan, and then the Wakhjir Pass, finally reaching Colonel Yonoff's headquarters across the boundary line. The Russians entertained them, then escorted them to Ak-Berdi

[30] *GJ*, 4 (1895), 380–381.
[31] *GJ*, 1 (1892), 65 (reporting article in *Deutsche Rundschau*); Nature, 47 (December 15, 1892), 160.
[32] *Nature*, 46 (June 16, 1892), 162; Deniker, "Explorations russes," 422.

on the Afghan frontier. They turned north again to Kashgar. From there the Earl continued toward the Tien Shan Mountains, hoping to shoot a tiger. He passed the Ming-ul River, Kan-su Pass, Ulukchat, and reached Osh. Along the route he passed Mr. and Mrs. Littledale on their way to Pe-king. He transferred to them his guide, Raudzan. From Srinagar to Osh he covered 2,000 miles. The Earl of Dunmore was a sportsman, not a trained scientist, and his observations, while interesting, tend to be superficial from the geographic point of view.[33]

Mr. and Mrs. St. George R. Littledale, in order to overcome the legend of inaccessibility of the Turkestan, in 1892 undertook an expedition across the central area, particularly that part not covered before. They were also especially interested in obtaining specimens of the elusive wild camel. Before leaving Russian Turkestan, they employed a guide who had travelled with the Earl of Dunmore, and there collected a good supply of transport animals. At Kurla they organized a caravan of twenty ponies and forty donkeys. At Kashgar Littledale, like many others, received helpful co-operation from the Russian Consul, Petrovski. The plan was to travel to the Altyn Tagh and Lan-chow-fu.

From Kashgar they easily crossed the desert to the Tarim and followed it downstream to the Lob-Nor. There their difficulties with water began. At the edges of the lake the water was too salty; but by wading toward the center, they obtained water which they could drink, though barely. They continued to the Altyn Tagh, where they lost some animals for lack of water and had difficulties with the Chinese officials. From this point on they had continual trouble with the guides who even concealed the existence of a spring from which they alone secretly drank at night. They finally proceeded along the range called Humboldt Range by Przhevalski, but after a study of the maps they declared that the so-called Ritter Range did not exist. In this desert they found a long embankment which they surmised to be part of the Great Wall. About the Humboldt Range on the other hand, they found abundant wild life: yaks, antelopes, and wild asses. Here some of the guides, hearing tales of Tangut bandits, deserted Littledale. At Lan-chow their interpreter refused to go any further.

The little group then continued on their own, without guides, to Bukhain Gol and Koko-Nor, then Si-ning and Lan-chow-fu. At Lan-chow some missionaries helped them prepare a raft on which they

[33] Earl of Dunmore, *The Pamirs*; *idem*, "Journeyings in the Pamirs and Central Asia."

floated down the Hoang-ho. They passed the Great Wall September 27 and reached Pe-king three days later. Mrs. Littledale, then, had the honor of being the first woman on record to cross that difficult route.[34]

This journey, while interesting in its way, offered little new information. Littledale was not a cartographer, although he tried to sketch his route. His reported purpose for the journey, to procure the wild camel, was successful: He shot four.[35]

At Kucha Littledale, who had heard of the Bower Manuscript, tried to get a guide to show him the caves; but the guide who helped Bower had received a hundred lashes for his temerity, and this exemplary punishment was so effective that it thwarted all of Littledale's efforts until he appealed to the local amban and got official permission. Then he found a guide and examined the caves, which are those of Ming-Oi. He was amazed at the many figurines of the Buddha. He then continued without going further into the archaeological treasures, reached Pe-king, and in November of the next year set out again to cross Tibet north to south.[36]

Both Mr. and Mrs. Littledale were inveterate hunters. In 1897 again, they accompanied Prince San Donato and his wife on a hunting trip to gather specimens of the famous Wild Sheep of the Altai, the *Ovis poli*. This trip was almost entirely confined to the Siberian side of the Chinese boundary. They barely crossed the frontier, and then only in the Kobdo district of Mongolia.[37]

Another of the minor travellers who passed through Central Asia in 1892 was Henry Lansdell, D.D., who undertook the trip purely as a reconnaissance for missionary purposes. He had also hoped to visit Lhasa, which had become a sort of international goal for daring travellers because of the many unsuccessful attempts to reach it over the armed resistance of the Tibetans. Dr. Lansdell started from the railhead in Russian possessions to Kuldja, then across Muzart Pass to Ak-su- Kashgar, Khotan, Karakoram Pass, and Ladakh. He covered no new routes or areas, but the study of the history of the area made it possible for him to write one of the best historical accounts of the region up to his time.[38]

[34] *GJ*, 2 (1893), 458, 549.
[35] Littledale, "A Journey across Central Asia."
[36] Littledale, "A Journey across Central Asia"; review in *Nature*, 49 (April 12, 1894), 567; Littledale, Obituary, in *GJ*, 78 (1931), 95–96.
[37] E. Demidoff, Prince San Donato, *After Wild Sheep in the Altai and Mongolia.*
[38] Henry Lansdell, *Chinese Central Asia. A Ride to Little Tibet.*

In 1892 the formidable peak of Mustagh-ata attracted mountain climbers. One of the more famous was M. W. Conway, whom the Royal Geographical Society of London commissioned to attempt an ascent. The party consisted of Lieutenant C. G. Bruce of the 5th Gurkhas, Artist-painter A. D. McCormick, and Alpinist Zurbriggen. Three others started out with them – J. H. Roudebush, O. Eckenstein and Colonel Lloyd Dickin. They left Srinagar April 13, 1892 for Gilgit, passed glaciers Hopar and Hispar Pass and Biofu Glacier. August 5 they climbed Baltoro, a four-day feat. As they climbed the main mountains, they gave names to the various peaks they passed. Finally, suffering from mountain sickness, they reached a deep crevice which they could not cross. They therefore had to withdraw. They explored around the foot of the Mustagh for six months before leaving.[39]

The Russian expedition under Captain Roborovski was the main exploratory achievement of 1893.[40] The assistant in command was Lieutenant Pëtr Kuzmich Kozlov, another experienced explorer. Other members were Ladyghin, a teacher of natural sciences; Kurilovich, who prepared zoölogical specimens, and six Cossacks as escort. Following the practice of Przhevalski, they moved their headquarters to a central location and sent out smaller parties from that site. Beginning at Issyk-Kul August 8, 1893, they headed first for the Yuldus Plateau (on the Haidu River, a tributary of Bagrach Kul) by following the Tekes, crossing two passes, the Murkhurdai, and the Sari-tyur. At Yuldus the expedition found a Buddhist priest once befriended by Przhevalski; and through his kindness they found guides to lead them to Kucha and to Karashahr. They then advanced down the Khaidik Gol to an area badly cut up into ravines, called Dalin-davan, or Seventy Passes. Kozlov then made a side trip; and when he returned, they continued to the Luk-chun or Turfan Depression. At the small town of Luk-chun they set up a meteorological station where they made observations regularly from December, 1893 to October, 1895. They found that the summer is hotter than elsewhere and the winter colder

[39] Capus, "Les Ascensions de M. W. Conway dans le Karakorum."
[40] A. Pozdnéeff, Professor of Mongolian dialects and literature, St. Petersburg University, travelled from Siberia to Kiakhta, Urga, Ulias-sutai, Kobdo, and Kalgan, collecting printed and manuscript books in Mongolian, but he did not enter Turkestan proper – "Mongolia and the Mongols. Results of a Journey made to Mongolia in the Years 1892–1893," St. Petersburg, (Russian Geographical Society) 1896.*

than previously estimated. It also showed the most extreme range of barometric pressure anywhere on the globe.[41]

Moving west, they divided into two groups. Kozlov and two Cossacks went straight east from Turfan, along the Konche-daria, to Lob-Nor, and east, where he reported inhabitants of "Aryan" and Turko-Mongol ethnic origin. Roborovski went up to Hami, then south to Su-chow, where he identified the Chol-tagh or Desert Mountains, Chinese Pei-shan, and the Kuruk-tagh or Dry Mountains, Chinese Nan-Shan. Along the way he added to his collection of the rare wild camels. He then crossed the Astyn-Tagh to the Keriya River, on the north slopes of the Kun-lun, where the sharp stones punished the horses' feet badly. He then visited Achik-Kul, Chom-kum-kul, and the "Unfreezing" Lake at an altitude or 13,000 feet. He then continued to the Cherchen-daria, where he noted a great abundance of wild life of all sizes, marshes, and signs of recent dessication.[42]

The expedition spent the winter in headquarters at Su-chow, but they made smaller trips out to the Altyn-Tagh as far as Lake Khunetei-Nor. Then they went on to Bulungin-Nor and Tangin Kutul Pass and back to Su-chow. Kozlov then explored to Su-lei-ho River and followed it 200 miles to its source. Thus by the spring of 1894 the Nan Shan was mapped for 430 miles.

When they left Su-chow in May, they passed the Cave of the Thousand Buddhas, in which they noted that many of the statues had been broken by the Moslems during the recent rebellion. They set up a headquarters at the spring which is the source of the Dan-ho River. From there they further explored the mountains in a systematic manner, the Humboldt Range, the Ritter Range, the Mushkétoff Range, and their valleys. Kozlov then explored the Alexander III Range.

The expedition then continued to Ulan-bulak and there explored the Nan Shan. The next station was Yamatin-umru, where they explored about Lake Koko-Nor. There Roborovski was stricken by a kind of paralysis; but, after a delay, the expedition went on to Kara-Nor. They gradually returned to Kurlik in August of 1894. There, besides making a collection of botanical and zoological specimens, they made a geographical study of the Tsaidam and extended their work on the Nan

[41] *GJ*, 13 (1899), 432, and 15 (1900), 176; de Tillo in *Izvestia* of the Imperial Geographical Society, (1899), 154.*

[42] *Nature*, 56 (May 13, 1896), 27–28.

Shan. In December the main body returned to Luk-chun, then to Urumchi, Manass, and on to Issyk-Kul, while Kozlov returned via Guchen.

In all, the expedition had covered 10,000 miles with surveys, had determined 30 points astronomically, and had gathered much meteorological data. The natural-history collection contained 250 skins, 30 skeletons, 1,200 birds, 450 fish, 30,000 insects, 25,000 plants, 300 seeds, and 350 specimens of rocks.[43]

The year 1894 was another active one for travel in the Turkestan. While Roborovski surveyed the eastern area, another expedition under Obruchev explored the edges of Tibet and the eastern Tien Shan. Obruchev started a geological survey along the Kiakhta-Peking route, then crossed Shan-si, Shen-si, and Kan-su, continued to Lan-chow and Su-chow, and crossed the seven main chains of the Nan Shan. Crossing the Tsaidam, he passed Koko-Nor and Donkyr and reached Si-nin and then Lan-chow again, Edzin-gol, Gourban, Saikan. He crossed the Golbyn-Gobi and the Ordos northwest to southeast. The Golbyn-Gobi was considered the most terrible desert in Central Asia, but Obruchev crossed it with only a Cossack as support. From Lan-chow he studied the Nan Shan further, crossed the Pei Shan plateau, and went on to Hami and Luk-chun. He then returned to Russia via Turfan, Urumchi, and Kuldja. He had covered 9,400 miles, gathering geological information, and he had discovered a high range to which the Geographical Society gave the name Alexander III Range. For this work Obruchev received the Przhevalski Prize of 600 rubles.[44]

The following year Klementz won the Przhevalski prize for explorations in Mongolia.[45] In the fall of this same year, 1894, Bere-

[43] "The Central Asian Expedition of Captain Roborovski," in *GJ*, 8 (1896), 161–173; P. K., "The Conclusion of Roborovski's Expedition 1893–1895," in *GJ*, 9 (1897), 553–555; V. I. Roborovski, "Preliminary Report on the Expedition to Central Asia," in *Izvestia* of the Imperial Russian Geographical Society, 34 (1898), 1–59.* These figures do not always agree. See also *Nature*, 53 (December 19, 1895), 160; 76 (May 9, 1907), 42–43; Deniker, "Explorations russes," 418. The expedition met a Belgian named Splingaerd, who spoke Chinese well after a long residence in China. I have no other reference to him.

[44] Deniker, "Explorations russes," 434. According to Deniker the report on these travels have only been published piecemeal in the *Izvestia* of the Imperial Russian Geographical Society, 29 (1893), No. 5; 30 (1894), No. 1, 2, 6; partly translated and published in *PM* and in the *Zapiski* of the Russian Society of Mineralogy, 2nd Series, St. Petersburg, 1895, and in Obruchev, *Aus China* (1896).*

[45] *GJ*, 9 (1897), 567. Report of his expedition was published in the *Izvestia* of the Imperial Geographical Society with the title "Middle Nan Shan" in 1894.*

zovski, who was working in the southwestern provinces of China, began his return to Russia.[46]

While Przhevalski and his followers failed to reach Lhasa by force, the feat was accomplished peaceably by a single man approaching from the same direction. A Kalmuck Lama, Baza-Bakcha Meunkeundjeur, of European education, started in 1891 from Astrakhan, went on to Kiakhta, and from there followed Przhevalski's old route to the Nap-tchou or Salween. He then followed the route of Buddhist pilgrims on to Lhasa, where he spent a year. After visiting several local shrines, he returned via Kumbun and Lan-chow to Pe-king, thence in 1894 by sea to Russia. He evidently encountered no opposition, and his report was the first made by a Russian subject, though in the Kalmuck language.[47]

Also in 1894 Madame Massieu, a French lady who had been doing ethnological studies of British India, decided to return to France via Central Asia, that is, Ladakh, Karakoram, Kilian, Kashgar, and on to Ak-su, Maral-bashi, and Kara-Kul. It is not clear how well she succeeded.[48]

In 1895 Clive Bigham, a veteran of the Grenadier Guards and a journalist by trade, with typical 19th-century British verve, saw a challenge in the order of the Sultan of Turkey prohibiting Europeans from entering North Turkey because of the Armenian troubles. He resolved to enter the area. A month after leaving London, he was in Armenia. On his return he conceived the plan of travelling to northwest China and returning via the Trans-Siberian railway. After a tour via Baghdad and Meshed, he rode the railroad as far as Samarkand, then drove via Khojent and Marghilan to Osh, which he reached May 5. There he hired a caravan to take him to Kashgar. This road led him via Sufi-Kurgan and the frontier fort of Irkestan. Five days after crossing the frontier he reached Kashgar, where he was impressed by the elaborate style of the Russian Consul-general, Petrovski, as opposed to the meager position of Macartney, the British "agent".

Leaving Kashgar, he crossed the Tuman River, but because of bad weather and the exhaustion of his provisions, he failed to reach Bogusty Pass. He decided to try to reach Chadir-Kul and succeeded. Thus he reached Naryn June 2. From there it took 14 days to reach

[46] *GJ*, 5 (1895), 489.

[47] *GJ*, 9 (1897), 567; Baza-Bakcha, *Skazanie o Khojdenii* . . . (St. Petersburg, 1897). Translated to Russian by A. Pozdnieev – Deniker, "Explorations russes," 425.

[48] *GJ*, 6 (1895), 281.

Omsk and the Trans-Siberian Railway. Bigham was essentially a journalist, and his report and observations were in keeping with his trade.[49]

For the year 1894, however, the most significant trip was doubtless that of Sven Hedin, who then began the first of his long and fruitful explorations. Dr. Hedin had achieved some reputation as an explorer in Iran, and he turned to Central Asia in 1890, when he visited Kashgar, entering from Osh through Terek-davan Pass and the Chinese frontier at Ulug-Chat. He then proposed an expedition to the less-known parts. In October, 1893 he returned to Kashgar via Margelan and Pamirski Post. At Margelan he took into his service Islam Baï, who was to travel with him for many years. Hedin had adequate funds for the expedition. Profiting from the help of Nikolai Feodorovitch Petrovski, Consul at Kashgar, he started out with a small group of aides and spent most of 1894 studying Kara-Kul Lake, the climate, and the glaciers of the Pamirs, and even climbing 20,000 of the 25,000 feet of the Mustagh Ata or Tagarma Mountain. He then returned to Kashgar for the winter of 1894, and there he met Mr. and Mrs. Littledale who were preparing for travel in Tibet. He also met Macartney, Younghusband, Father Hendricks (a Dutch Missionary) and a Pole, Adam Ignatieff, all residents there. In the spring of 1895 he began exploring the country between Kashgar and the Yarkand River. In April he crossed the Takla-Makan between the Khotan and Yarkand Rivers. Hedin is the first person in modern times known to have done this. He barely got across alive, and he did lose his instruments. Some of them were later on recovered from thieves. He returned to Kashgar to get new instruments, which he ordered from Tashkent, and to visit the Anglo-Russian Boundary Commission in the Pamirs. He met the leaders, General Pavalo-Shweikovski and General Gerard. Other Englishmen in the party were Macartney, Geographer Sir Thomas Holdrich, and Captain McSwiney. In December, 1895 Hedin set out again from Khotan and Yarkand, crossed the desert to the Keriya River, and followed this river to its end in the sands. He then continued across the desert north to the Tarim and on the way noted the existence of buried cities that once possessed some degree of culture and that showed a strong Indian influence. He even picked up a few fragments of manuscripts fluttering about the ruins of a deserted city that he called Takla-Makan. He then continued across the desert north to the Tarim and then followed the Tarim down to where

[49] Bigham, *A Ride through Western Asia.*

Chinese maps placed Lob-Nor, but it was not there. He found it at some distance from the supposed location. He concluded that there was a north and south lake with lacustrine beds between and about both. He then returned to Khotan and set out for Tibet, crossing the Kun-lun by a pass at the Kopa Goldfields, passing the Altyn-tagh and Arka-tagh. He travelled in a complete desert in North Tibet for two months, then headed northeast for the Tsaidam. There he met some Mongols and had to fight off an attack by Tangut robbers. He passed Si-ning and Lan-chow to Ordos and Pe-king, then returned to Europe via Urga and the Trans-Siberian Railroad.[50] He had travelled 14,600 miles, 2,020 of which had not been covered by Europeans before. He had mapped 6,520 miles.

Besides his scientific accomplishments Hedin was a writer of some skill, and his books helped popularize the exploration of the area. He had covered much ground not described before and brought back many items of antiquarian interest as well as others for the museums. Besides numerous lectures and reviews, he produced a popular edition of his travels within the next two years[51] and later on, with the help of specialists, a full, scientific report.[52] For this work Hedin received the Founder's Medal from the Royal Geographical Society, May 23, 1898.[53]

In the meantime the English had not been idle. In the spring of 1896 Captain H. H. Deasy obtained leave from his military duties with the idea of exploring in Northern Tibet. He was accompanied by Arnold Pike, with whom he had travelled before. They started from Srinagar April 27 and reached Leh with a train of 105 coolies to carry the baggage. There they transferred the baggage to 25 mules. They started again May 25 and crossed the Marsemik-La. Deasy proposed to follow the route of Lieutenant Bower's Tibetan Journey to Horpa or Gurmen Cho, then turn east. They began surveying at Gurmen

[50] Sven Hedin, "Four Years' Travel in Central Asia," in *GJ*, 11 (1898), 240–258, 397–415; "The Lob Nor Controversy," in *GJ*, 11 (1898), 652–658; *GJ*, 4 (1894), 174–175, 457–458; *GJ*, 5 (1895), 154–156 (Letter, Kashgar, November 9, 1894), 271–272; *GJ*, 6 (1895), 78–79, 281; Letter, Kashgar, October 20, 1895, *GJ*, 7 (1896), 195–198; *GJ*, 8 (1896), 635; *GJ*, 10 (1897), 92, 209–210; *GJ*, 14 (1899), 90; *Nature*, 55 (November 19, 1896), 59, 589; *AG*, 4 (1897), 189; *AG*, 10 (1901), 373–375. For a short account of the Afghan Border Commission see Gordon, *The Roof of the World*, 215.

[51] Hedin, *Through Asia*; *Durch Asiens Wüsten*.

[52] Hedin, "Die geographisch-wissenschaftlichen Ergebnisse . . . ," in *PM*, Ergänzungsheft No. 131, 399 pp.

[53] *GJ*, 12 (1898), 86–87.

Cho, basing their horizontal figures on the survey of Mangtza Lake, No. 1 Peak. They could not use the height, which had not been determined, and for elevations they used only a mercury barometer.

The group crossed the Lanak La, where the temperature fell to —8 degrees F., and travelled over eastern Tibet, making a survey that covered some 24,000 square miles. They went on to India via Napo-La, with only six left of the sixty-six ponies with which they had started.

In 1897 again Captain Deasy started out, accompanied by R. P. Cobbold as far as the Taghdumbash Pamir. At Kilik Pass they met an American, Isidore Morse, whose tales of good hunting north of the Tarim led Cobbold to leave Deasy with a small party of helpers, including an Indian surveyor, and to go on to Kashgar. Deasy's party began surveying work at the Taghdumbash Pamir October 22, then they moved to Ujadbai and Mazar Sultan, Raskam River, Bazar Dara, Zad, Sandal-davan, Yarkand, Chumdi, then Yarkand again. At Yarkand Deasy decided to investigate some of the ruins and buried cities reported by Bower. He hired a guide who misled him, and they wandered about in the Takla-Makan until Deasy finally gave up. His description of tree trunks sticking up out of the sand, however, indicates that he probably walked over several rich sites without realizing it.

Captain Deasy then continued his surveying to Keriya, then back to Polu, Langar, and Uchi. At Uchi he tried to tie his surveys in with those of Grombechevski, who had been in the area four years before, but he failed. Then he went on to Mariong, Nosh Tung, Pichanyart, the Pil Valley, Chadder Tash, Pilipert, Mamakul Pass, Tir, Kosarab, and up to Kashgar. There he found that his health was failing as a result of his travels, and he decided to return to Leh. He returned via the Lanak La.[54] His travels were quite productive in extending the British survey further east into Chinese Turkestan than it had been before, and further into Northern Tibet.

After leaving Deasy, Cobbold continued to Kashgar via the Gez Defile. From Kashgar he crossed the Tien Shan range by the Turgat

[54] Deasy, "A Journey to Northern Tibet and Aksai-Chin," in *GJ*, 13 (1899), 155–159 (a letter from Yarkand, October 31, 1898); *GJ*, 8 (1896), 296, 635; *GJ*, 11 (1898), 545, 665–666; *GJ*, 12 (1898), 311; *GJ*, 13 (1899), 628–630 ("Explorations in Sarikol," a letter from Kashgar, March 7, 1899), 656; Deasy, "Journeys in Central Asia," in *GJ*, 16 (1900), 141–164, 501–527 and map. During the discussion at the end of this paper, a Captain Kennion referred to a Mr. Phelps who travelled from India to the Tien Shan via Yarkand to shoot big game in the Snowy Mountains. I have no other reference to Mr. Phelps.

(Tur Agat) and Tash Rabat passes and Lake Chatir Kul to the Naryn Valley, then past Issyk Kul. He was the first Englishman to travel over some of this territory, although it was known from Russian explorations. At Akbashi the temperature reached —27 degrees F. He reached Vernyi, then returned to Lake Balkhash following the Ili River and experiencing a temperature of —36 degrees. At Balkash he bagged a tiger, said to be the northernmost tiger ever killed by an Englishman.[55] He then returned to Vernyi, crossed the Tien Shan, and returned to the Gez Defile after noting the mineral wealth of the Tien Shan. He passed Kara-kul, Tashkurgan, and the Bartang Defile and at Kala-i-wamar he was arrested as a spy, taken to Shignan, and sent back to Kara-art Pass on July 1, 1898. He then passed Mustagh Ata, Tashkurgan, and Sari-kol and returned to Gilgit August 4. Besides a botanical collection, Cobbold took many photographs and brought back several volumes of ancient manuscripts. He did no surveying but did notice several inaccuracies in maps, which he corrected.[56] The identity of the manuscripts he brought back has not been established.

Meantime the Russians had not been idle. The Klementz Expedition to Dzungaria and Chinese Turkestan returned in 1898 with surveys of the Altai and western Gobi, and with meteorological observations and zoological and botanical collections. Besides this Klementz also visited ruins of ancient cities near Turfan, Khara-Khoja, and Toek Mazar. He found a series of Buddhist temples, with well-preserved frescoes, ancient manuscripts, and inscriptions in Chinese, Sanskrit, and other languages. He examined one hundred and thirty of these cave temples and brought back some of the frescoes and inscriptions, as well as many manuscripts, but what has become of them is not clear.[57]

The same year, 1898, V. F. Novitzki returned from a trip to India via Ladak, the Karakoram, Raskem, and Kashgar to Osh. He crossed the Raskem by a difficult pass never before traversed by an European, losing nearly all of his baggage in the attempt.[58]

Two German geologists, Professor Karl Futterer of Karlsruhe and Dr. Holderer in 1898–1899 undertook a separate expedition through Asia to gather specialized scientific data. Their route started as usual, at Vienna, continued to Tiflis, Krasnovodsk, and Tashkent, and then from Osh to Terek-davan, Kashgar, the Tarim Valley (via Ak-su,

[55] *GJ*, 13 (1899), 66; *Nature*, 61 (March 22, 1900), 495–497.
[56] *GJ*, 13 (1899), 66; Cobbold, "A Sample of Chinese Administration."
[57] *GJ*, 13 (1899), 658.
[58] *GJ*, 13 (1899), 658.

Kara Shahr, Turfan, Hami) across the Gobi Desert to Su-chow, Koko-Nor, Hankow, and Shanghai, and return by boat. They had along no cartographers or surveyors, and their route is hard to follow from the sketch maps provided later. The purpose was not to seek untrodden paths but to make a geological study of some of the regions where this study was most needed. They took about 700 photographs to illustrate the physiography of the steppe lands of Inner Asia, and their travel was largely done in the winter.

The two scientists studied the history of Kashgar and its conquest by China. They described the oases of the Tien Shan Pei Lu (the Chinese name for the settlements on the slopes of the Tien Shan Range). Futterer described the desert stretches, clay steppes, moving sand, and vegetable cover and tree cover. He covered some of the same ground as the Széchneny Expedition of 1878–1879 in the Gobi area, comparing it with the southern Tien Shan. This route ran from Karashahr to Hami over the eastern Tien Shan area. He also reported the deep canyons and eroded clay mountains about the Han Hai Basin.

Reporting on the Turfan-Lukchun Depression, the site of so many excavations in the next decade, and which lies between two east-west ranges of the eastern Tien Shan, covering some 5,000 square kilometers, he, like the Grum-Grjimailo Brothers, noted the dryness and winds that characterize the climate of this depression. However, the oases of Turfan, Toksun, Pichan, and Lukchun were in bloom. Futterer noted that the underground irrigation system of *Karuse* (ghanats?) was like that of Iran. For temperature variation he noted in April a range of from 0° C. at night to 34° C. at noon. This was accompanied by a dust storm.

In Hami he noted the small population, which he blamed on the bloody Dungan uprising of 1866–1870 in Kan-su Province and neighboring areas. In the stores he noticed Japanese, Russian, and Chinese wares.

In May he crossed the Gobi between Hami and Su-chow. In 1875 Sossnovski and Piassetski crossed the narrowest place. Since then many European travellers have crossed it – Mandl, Przhevalski, Roborovski, Obruchev, the Grum-Grjimailo Brothers, all along various routes. Futterer, however, crossed it in early summer and found it to be not entirely without vegetation and water; in fact its green grass and scattered vegetation in many places gave it the appearance of a steppe. He even found the remains of old dwellings and station houses. It remained for him an open question whether the increasing dryness,

a change in the water flow, or the Dungan uprising were the causes responsible for the dessication of the area once spotted with settlements.

From the Koko-Nor the expedition continued into an area out of the range of this work.[59]

Since the time of the Grenard-Dutreuil de Rhins Expedition there had been a lapse in French participation in the travel and study of Chinese Turkestan, but after a delay of several years Charles-Eudes Bonin undertook to continue the work. He left Pe-king in April, 1899 with the intention of following the great silk route of antiquity. He passed through Kuku-Khoto or Kwei Hwa Cheng and reached the Hoang Ho near Tokto, continued up the Hoang Ho to Ning Hsia, then through the Alashan, making an ethnographic study of the Eleuth Mongols along the way. In nineteen days he reached Liang-Chou and from there took a new route through the Nan Shan to Koko-Nor. Along the way he located several peaks higher than any located by Przhevalski. He rested at Kum-bun and studied the famous monastery. From Koko-Nor he went northeast to the Poku-ho Range. Between Kan-su and Ngan-si he visited many recently opened mines. From Ngan-si he went on to Su-chow Oasis, then to the Kara-Nor and the Pei Shan Mountains. After travelling west, where he found traces of ancient walls and blockhouses, he turned south to the Astyn-Tagh to examine the probable routes of the old silk merchants. Here he travelled at higher altitudes than had Littledale; in the Tarim Valley he met Sven Hedin on his second trip. Then he continued north, crossed the Tien Shan by a new route to Urumchi, then continued via Kuldja and Samarkand to Krasnovodsk.[60]

Another Frenchman, Chaffanjon, with companions Gay and Mangini, crossed Asia west to east in 1896 north of the Littledale route: From Issyk-Kul to Kuldja, then to Ebi-Nor, Dzungaria, Tarbagatai, Lake Uliungur, Altaï, Kobdo, Ulias-sutai, Urga, Karakorum, Tsitsikar, and to the Amur.[61]

Again, later in 1899 C. Saint Ives undertook a journey to Chinese Turkestan and the Pamirs. From Andijan, end of the Trans-Caspian

[59] "Futterer's Reise in Central Asia," a review of Futterer, *Durch Asien*, in *PM*, 51 (1905), 165–168; *GJ*, 11 (1898), 664–665; *GJ*, 12 (1898), 520–521; *GJ*, 13 (1899), 430.

[60] *GJ*, 16 (1900), 99 [reporting a letter of Bonin, Karashahr, December 31, 1899, in *La géographie* (March, 1900)]; *GJ*, 17 (1901), 526–527 [reporting article in *La géographie*, No. 2, 3 (1900)].

[61] *AG*, 6 (1897), 190–191.

Railroad, he continued to Osh and Gulcha, where he examined the ruins dating from the times of the khans of Kokhand. From Gulcha he followed the military road to Sufi-Kurgan, then to Alaï, west of the Terek-davan, as he wanted to investigate the passes. He succeeded in discovering three new passes, all high and difficult. At Irkeshtam on the frontier, he detoured to explore the Maltabar Range, part of the Mustagh Ata. He visited the peak called after Dutreuil de Rhins, 18,000 feet high. Then he followed the valley of the Kovan, a little-known tributary of the Kizil-su, or Kashgar River. He tried to follow the Kizil-su down to its confluence with the Markan-Su but failed. From Kashgar he followed the Kenkol and Chichiklik Pass to Ak-su. On his return he crossed the Alai by the Jiptik Pass.[62]

In the spring of 1899 the Russian Geographical Society, continuing its hitherto unsuccessful efforts to penetrate the forbidden and forbidding Tibetan heartland, organized a new expedition under the leadership of Captain P. K. Kozlov, with funds provided by the Tsar. Bogdanovich, who had been a leader on a previous expedition, was then absent on another trip to Eastern Siberia.[63] Kozlov included Captain A. N. Kaznakov in his party; and also B. Th. Ladyghin for a second time, and it was the latter who undertook to look after the botanical and zoological collection as well as to serve as interpreter, since he knew the Chinese and Manchurian languages very well, and some Eastern Turki. Both Ladyghin and Kaznakov were able to do surveying, and they performed that duty while Kozlov kept the geographical, meteorological, and zoological diaries and determined the astronomical positions as well as collecting birds and mammals. The expedition had an escort of sixteen soldiers led by Sergeant Ivanov, who had been on three expeditions under Przhevalski, accompanying Pievtsov and Roborovski. They also had a taxidermist, and a hunter, and Tsokto Badmajapoff, who acted as interpreter for Mongolian.

The expedition met in the Province of Semi-Palatinsk in July, 1899, where they outfitted the expedition. They had 54 camels, 14 horses, and a flock of sheep. On August 1 they crossed the Pass of Ulan-davan on the Russo-Chinese border and there divided into two parts. Kozlov went on to Kobdo while the others went along the Altai Range, seeking the source of the Kobdo River. They met in Kobdo a few days later.

On leaving Kobdo they again parted at the temple of Tuguryughen-

[62] *GJ*, 15 (1900), 533 [reporting on article in *La géographie*, No. 2 (1900)].

[63] *GJ*, 13 (1899), 432, 658; *GJ*, 15 (1900), 56–57.

kyure on the Tsenkyr-gol River, north slope of the Altai. Kazmakov explored the eastern steppe of the Altai, while Kozlov moved south. They met again at the Wells of Chatsering Hi Huduk, and from there they sent the collection of specimens to Russia. By then they had covered 2,900 miles with surveys.

They left Chatsering Hi December 13, 1899. Kozlov followed the caravan route to Lan-chow, while Kazmakov followed the lakes formed by the Etsin-gol River. Ladyghin also explored the Gobi farther west and found it to be all gravel – no sand until he neared Su-chow.

The expedition met again at the Monastery of Chortan-tau, near Si-nin. They left part of their specimens with the hospitable lamas at the monastery and continued south with letters of recommendation for the Tibetans. Crossing the Tsaidam, they set up a meteorological station at the monastery of Baruntsask and there left their camels and collections in charge of Sergeant Muraviov.

May 30, 1900 they started out again for Tibet and reached the source of the Hoang-ho, but the danger of attack from a band of robbers forced them to circle the area and head straight south, where they found time to explore the upper reaches of the Mekong, the Yellow River, the "Blue" River. Here the Tibetans they met were friendly. When they reached Lake Rhombo the Tibetans appeared frightened; and it was finally ascertained that they feared that the expedition was a punitive force sent to avenge the murder of Dutreuils de Rhins near this spot.

After exploring for nine months in Tibet, the return journey started August 14, 1901. The expedition retraced most of its steps, recovered its deposits, and reached Russian territory by well-travelled caravan routes in November, 1901. The expedition had 8,000 miles of surveys, had 40 astronomically determined positions, a wealth of historical and ethnographical data, 400 photographs, 1,200 geological specimens, 30,000 botanical specimens, including 1,400 species of plants, 300 mammal skins, 10 skeletons, 1,500 birds, 500 fish and reptiles, and 30,000 insects.[64]

The second journey of Sven Hedin began in 1899, when he returned to Central Asia from his tour and writing in Europe. The expedition was financed by King Oscar and Emanuel Nobel. He brought more elaborate equipment than he had had before, all free of customs duty by courtesy of the Tsar, who also furnished him an escort of four

[64] Kozlov, "The Russian Tibet Expedition 1899–1901," in *GJ*, 19 (1902), 576–598; *GJ*, 18 (1901), 441; *GJ*, 19 (1902), 85.

Cossacks, a railroad car, and free transportation through Russian territory.

Reaching Osh by railroad, he then followed the usual road to Kashgar, and there outfitted his expedition of fifteen camels and ten horses. In this work he had the help of Petrovski, Father Hendricks, and Högland, a Swedish missionary. Besides the Cossacks (Sirkin, Chernoff, Shagdur, and Cherdon) he recruited two caravan leaders (Nias Haji and Turdu Baï), a camel driver (Faizullah), and a scribe (Kader). He had already contracted again for the services of Islam Baï at Andishan.

Hedin's new proposal was to float downstream on the Tarim to Lob-Nor. He went on to the Yarkand River just north of the city and there bought a sort of ferry boat, which he had refitted to hold some of his equipment and part of his party. On September 17 the caravan with two Cossacks set out for Ak-su and Korla on foot to meet Hedin at the mouth of the Tarim.

During the trip down the river he often ran aground, but the crew always managed to keep the boat afloat. This relative ease allowed time for much measuring and observation, and he mapped the river course in considerable detail. When the boat reached the lower reaches of the Tarim, winter had set in, and Hedin spent the next few months near there, at the Yangi-kol (New Lake). In the meantime the rest of the caravan with the two Cossacks rejoined him. Charles E. Bonin was travelling in the area at the time, and Hedin visited with him at Tura-Sallgan-ui.

March 5, 1900 the weather warmed up, and the expedition set out again to map the Kum-daria, the outlet that once was the main bed of the Tarim and flowed into Lob-Nor. They set up headquarters at Altimish Bulak and on leaving that area for the south, came upon the ruins of an old city. Some excavation was done, and they found coins and some wooden carvings. A shortage of water caused Hedin to give up the excavation after a short time and to continue to the Tsaidam. He carefully explored the edges of Lob-Nor and the lower Tarim. Then he went on to Mandarlik, then south to the Arka Tagh and Kalta Alaghan, then Lake Achik-koll. By March 2 he was back in the area of Altimish Bulak, and this time he took pains to explore the buried city he had noticed before. This search also uncovered three other sites under the sand, and he found a large amount of Chinese manuscript material and coins. Most of this material dated back to the fourth century A.D. One of the names that appeared in the MSS was Loulan,

which then became the center of a lively controversy among linguists and archaeologists.[65]

The explorer then examined Lake Kara Koshun, which he found to be disappearing. Then he moved south again to enter Tibet, disguised as a Buriat Lama. This subterfuge failed, and he had to withdraw without reaching Lhasa. Returning to his caravan, Hedin started to cross Tibet west of Lhasa. They found the inhabitants had been forbidden to sell provisions to them. He was stopped by force at Nakt-sang-tso (Lake) but later was allowed to travel with little molestation. He crossed Northern Tibet and went on to Leh at the end of 1902. He then returned to Kashgar, thence to Peterhof, where the Tsar decorated the four Cossacks. Hedin brought 1,149 sheets of cartographic material; he had travelled 10,500 kilometers, and had fixed the position of Lob-Nor. His chart of the Tarim (scale 1 : 35,000) covered one hundred sheets.

After this trip Hedin returned to Sweden and Western Europe, where he received the Victorian Medal of the Royal Geographical Society,[66] gave a number of lectures, and wrote up the results of his work, first in a fairly popular form,[67] and then, after much more study and with the aid of selected experts, in the form of a scientific treatise in five volumes.[68] This work took some three years.

In 1900 the Hungarian Dr. G. V. Almasý and Dr. Rudolf Stummer von Traunfels undertook a scientific expedition to the Seven Rivers on Lake Balkhash and the central part of the Tien Shan. The main

[65] Macartney, "Notices from Chinese Sources, on the Ancient Kingdom of Lou-lan, or Shen-Shan." At the site Hedin offered prizes for manuscripts uncovered, and the results were encouraging. In all he collected 36 pieces of writing, besides a variety of carved wood, statuettes, coins, and smaller items. Some of the writing was on paper, with dates going back to 150 or 200 A.D. Since the invention of paper in China only goes back to 105 A.D., these MSS therefore represent some of the oldest writing on paper in existence. These MSS were turned over to Karl Himly of Wiesbaden for study, then to Prof. A. Conrady of Leipzig. Thus they were translated and published, giving a boost to our knowledge of the ancient city of Lou-lan.

[66] *Nature*, 67 (December 11, 1902), 134; *Scientific American Supplement* No. 1341, 52 (September 14, 1901), p. 21489, evidently reprinted from the *London Times*; *idem* No. 1352, 52 (November 30, 1901), p. 21676–21677 – letter of October 30, 1900 to King of Sweden, reprinted from the *Evening Post*; *idem* No. 1432, 55 (June 13, 1903), p. 22954, translated and reprinted from *Le revue universelle** (Keltie, "Sven Hedin in Central Asia").

[67] Hedin, *Central Asia and Tibet*. His next expedition was mostly confined to Tibet, 1906–1908 – *Nature*, 80 (May 27, 1909), 372–373.

[68] Hedin, *Scientific Results of a Journey in Central Asia 1899–1902*; Charles Rabot, "L'exploration du Sr. Sven Hedin en Asie Centrale."

object was the zoo-geographical studies of that part of Asia where five river systems which do not empty into the sea are to be found, the Ili, the Ala-Taus with the Issyk-Kul Valley, the Chu, the Tas-Uschkan-Daryn, and the Tarim Basin, and finally the Syr Daryn. The field work was carried out by these men alone after the two scientific companions (a medical student from Graz and a student from Tiflis) had left the expedition at the beginning of the trip.

The main intention of the explorers was to undertake investigations in the field of zoology and especially in the study of small, invertebrate water animals; but Almasý also had an eye for the geography of the area and found time for some ethnographical, hydrographical, and orographical work. He took many photographs of the Khan Tengri Massif, which for the first time gave some idea of the surface forms of the central Tien Shan. His many photographs of ethnographic objects were of great use to the specialists.

The travellers started from Budapest, went down the Danube to Galaţi, then by steamer to Batum. From Batum they continued rapidly via Tiflis, Baku, Krasnovodsk, and Samarkand as far as Tashkent. Thence Almasý followed the post route through Vernyi to the Cossack town Iliysk on the Ili. This became the point of departure for the excursion into the Ili Valley and toward the Balkhash.

Because it was winter, they could not visit the Balkhash. They crossed the steppes north of the Trans-Ilian Alatau and followed the route over the Temïrlik-Tau (Nan Shan), the Kurkura Valley, and the San Tash Pass into the Valley of the Issyk-Kul. Almasý took some excellent photographs of these areas. Almasý was the first to visit the southern side of the Tien Shan in the region of Uch-Chat-Tau, southwest of the Khan Tengri Massif, and facing the Tarim Basin. Also he was the first to visit the Adyr-täs River course, which started from three small glaciers. The great Mushkétov Glacier shown on the maps and supposed to be the counterpart to the great Semënov glacier, could not be found.

He gave detailed notes on the forest vegetation of the mountains, the thick conifers that cover the high north and west areas, while in the lower areas especially in the Tekes there is widespread bush, heather, and impenetrable underbrush. The trees there begin to lose their leaves in September.

Here Almasý noted an influence of climate on fauna and even on the sparseness of the population. In the Karakol Valley and in Terskei Tau Almasý found that when he spoke to the Kara-Kirghiz tribes in

his own Hungarian language, they could in part understand him.

The two scientists continued to the Khan Tengri Massif. After passing the Terskei Ala Tau Range by the Türgen Ak-su passes, the travelers reached the Sari-Dscha (Sari-Ja) River, where he spent some six weeks in a thorough study. After a vain search of the tortuous terrain to find a pass through the Sari-Dscha or Dschan-art Pass, Almasý crossed the system of the Sari-Dscha Valley, following nearly all the side valleys to their glacier origins. In the Kapkak Pass he crossed the watershed between the Sari-Dscha and the Teke Valley and passed the Russian border town Naryn-kol (Gonatinjiki) on the northern slope of the Khan Tengri.

The return trip went over the Kapkak Pass and back by way of the Kok-sher (or Karkara) Valley.

Almasý found especially interesting the Syr formations, flat, grassy little plateaux for sheep, and the deep canyons in between. He gave detailed notes on the influence of climate on flora, fauna, and population. He reported all kinds of animals, their habits, and their hunting techniques, such as the *sapra sibirica* nov. subspec., the wild sheep *Ovis Poli Kurelini et typica*, the Maral deer, *Cervus enstephanus* or Maral, the *Cervus Pygergus*, tigers, bears, mountain panthers, *Felis uncia* or *irbis*, wolves, etc.

Considerable attention was given to the ethnographic features of the area, the bazaars, the household items used; especially thorough is the description of those of the Kara Kirghiz. Almasý studied the farming and grazing population and concluded that each was necessary to the other – the nomad to furnish meat raised in the lonely and scattered meadows in the mountains, and the sedentary people to furnish food of plant origin not available to the nomads, especially in the winter, when they depend heavily on milk. Thus he saw a sort of symbiosis in the economic relations of the groups.[69]

[69] *PM*, 51 (1905), 163.

VI – THE ARCHAEOLOGICAL PERIOD: 1901 TO 1914

The work of Dr. Mark Aurel Stein (later Sir Mark) furnishes the best example of the combination of geographical and archaeological exploration during this period. Geologists, geographers, missionaries, hunters, and naturalists had been over the ground already a number of times, but so far no qualified archaeologist had ventured into the area.

The year 1900 found Stein in the Indian Service as Inspector of Schools in the Punjab, and at the same time he was pursuing his own antiquarian interests, particularly in the field of Indology and History. Gradually the combination of finds from the Turkestan, the scraps discovered by Sven Hedin, and the paper and leaf fragments brought by Lieutenant Bower from his journey through the Turkestan area 1889–1891, bits of suspicious documents being sold in various towns of Central Asia, the Klements MSS, the Berezovski fragments, the Petrovski Collection, the manuscripts that survived the Dutreuil de Rhins Expedition, and the several reports of buried cities, all led Dr. Stein to want to try his luck in opening the field to science.[1] His

[1] *E.g.* Klements, "Turfan und seine Altertümer"; Oldenburg, "Fragmente von Kashgarischen Sanskrit-Handschriften aus der Petrovskischen Sammlung"; Hedin, *Durch Asiens Wüsten*, II, 53, 70. A further stimulus for this and other expeditions goes back to the meeting of the 12th International Congress of Orientalists in Rome in 1899. At that time Professor Hoernle read to the Indian Section a paper on the Central Asian antiquarian finds by Bower, Godfrey, and Macartney; Radloff summarized the manuscripts found by Klements at Turfan, and Sénart reported on a few such MSS at the Bibliothèque Nationale, mostly gifts by Captain Godfrey, and referred to reports by O. Donner from his travels in Turfan. After a discussion of the importance of these finds to the study of linguistics, the meeting moved to ask the Congress as a whole to urge the Russian Government and its institutions of learning to continue the archaeological work of Klements. The record of the Imperial Russian Government as a supporter of scientific inquiry and for sharing its knowledge with the learned world was at that time well established. Further, a committee was set up to present the motion to the Congress. The committee consisted of [Wilhelm] Radloff, [Rudolf] Hoernle, [Sergius von] Oldenburg, [Ernst] Leumann, Kuhn, L. von Schroeder, Rhys-Davids, Kern, Nocentini, Hirth, V. Thomsen, O. Donner, H. Cordier, and G. Huth – *12th International Congress of Orientalists, Rome*, Bulletin 19, Section VI, India, October 11, 1899 meeting. While the motion was directed to the Russian Gov-

successes more than justified his hopes; they set off a treasure hunt that lasted for ten years and left the desert area carefully despoiled of its secrets.

In June, 1900 on a year's leave of absence from his post, Stein started on his first journey. His party consisted of several servants and an expert Indian surveyor to map the area covered. The surveyor, Babu Ram Singh, had gone on the expedition with Captain Deasy; thus he was covering relatively familiar ground. At Srinagar they outfitted the expedition and started along the well-known path via Kilik Pass to Tashkurgan, Ulugh Rabat, Karakul Lake, Bulunkul, Tashmalik Fort, and Kashgar. Here he rested for some days re-fitting his expedition.

For years Kashgar had served and was yet to serve as a rallying point for explorers and travellers. It enjoyed an advantageous position as the only city in the area where some of the amenities of Europe were available. For some years it had been the seat of both a British and Russian consulate, both offices fortunately held for years by able, scholarly gentlemen who encouraged scientific study in the area – Macartney and Petrovsky. Communication from Kashgar to the west was better established than in the other directions; through Tashkent the city received European goods, and travel was possible on a scale enjoyed nowhere else in the territory. By 1900 a spur of the Trans-Siberian Railroad had reached Andijan.

Stein then followed the old road to Khotan, which he reached October 2. There, while seeking dependable guides, he and his surveyor made an attack on the upper reaches of the Yurung Kash River, which had defied the explorations of Deasy and others. With great difficulty they succeeded in tracing the river to its source in the Kun Lun and obtaining enough data for a reasonably accurate map of the river system. This survey at last linked Khotan into the Trigonometrical Survey of India and definitely fixed its location.

The middle of November he returned to Khotan to hear the reports of several "prospecting parties" he had sent out a month earlier. From them he selected Dandan-Ulik as the most promising site, the same which Hedin had referred to as the "Ancient City of Takla-Makan". With thirty laborers Stein moved to this site between the Yurung Kash and the Keriya Rivers, and began systematic excavation. He found

ernment, clearly the competitive spirit of the early 20th century would not allow one country to dominate the field.

stucco images, frescoes, wooden tablets, and a wealth of household items, mostly belonging to the early Indian cultural period. He also found a large amount of Sanskrit manuscript material which dated from the 6th or 7th centuries.

Stein excavated for three weeks at Dandan-Ulik in spite of great discomfort, including a painful tooth. At the same time Ram Singh continued surveys of the Kun-Lun area.

On January 6, 1901 he moved his operations to a mound in the sands of the Niya River, which was to become famous as the Niya Site. Here again he found liberal quantities of old objects and wooden tablets, this time with Kharoṣṭhi writing. Here, too, mingled with Sanskrit manuscripts, he found seals and figurines that showed an influence and direct contact with motifs of Greek origin.

From Niya, Stein continued to the Endere Site, where he again found buried houses, stupas, and other smaller objects in the sands where the Endere River once flowed.

Stein then began the return trip to Khotan, and after a rest started out again for the site at Rawak, not far from Dandan-Ulik. Here again, at every turn he uncovered priceless relics of the previous milennium, particularly in statues and art work.

On his return to Khotan again with his loads of manuscripts and art treasures, Stein paused to investigate the so-called block prints which had been sold freely in the markets at Khotan and Kashgar. He identified many of them as a hoax perpetrated by a clever forger, Islam Akhun.

April 28, 1901 he left Khotan and returned to Kashgar, and there he parted from his companions. Ram Singh and the others returned to India while Stein with his twelve large boxes of treasures crossed the mountains to Andijan, where he took the Trans-Caspian Railway to Krasnovodsk, crossed to Baku, and on July 2, 1901 reached London and the British Museum.[2] On his arrival with the manuscripts and museum pieces he took time to prepare a preliminary report,[3] which gave the rough arrangement of the collection. He then returned to India and to his duties as Inspector of Schools, but the Indian Government granted him an 8-month leave to return to England and prepare a detailed report. In addition to a series of lectures he prepared the report,[4] which gave an account of the expedition with numerous illus-

[2] M. A. Stein, "A Journey of Geographical and Archaeological Exploration in Chinese Turkestan," in *GJ*, 20 (1902), 575–610.

[3] Stein, *Preliminary Report* . . . .

[4] Stein, *Ancient Khotan*; notice in *Nature*, 67 (January 8, 1903), 231.

trations of the objects discovered and a historical summary of the region.

In recognition of the importance of this work, in 1903 the Royal Geographical Society awarded Dr. Stein the Back Grant.[5]

In the meantime on August 22, 1902 Kashgar and much nearby land suffered a disastrous earthquake. Beginning at 8:00 A.M., the shocks lasted 1.5 minutes. Houses and walls of unsubstantial, sun-baked mud suffered most, and some deaths resulted. Other quakes followed until August 30. Reports placed deaths then at over 600 in the Artush area north of Kashgar. North of the Tien Shan, at Naryn, Atbashi, and east in Yarkand, the shocks were lighter. Seismographs in India announced the shocks as of the first magnitude, but lack of communication kept scientists from studying the area carefully. They estimated the epicentre as 40° N–74° E.[6]

Stein's successes immediately aroused activity in other countries. Upon the publication of his reports several other nations began to send collecting expeditions.

The first of the competing expeditions started on August 16, 1902. A party of Japanese led by Count K. Otani, who happened to be in England when Stein arrived, set out from England to try their hand at exploration among the Buddhist temples. Otani was accompanied by M. Hori, who had just finished a year at the School of Geography at Oxford. They apparently travelled by rail to Osh and then went overland to Kashgar via the Terek-davan. Then they continued to Tash-Kurgan. Because Count Otani had to be in Japan early in 1903, he left the rest of the party and continued south to India, while Hori and their assistant Watanabe remained. From Tash-Kurgan they crossed the Khandar-davan on yaks and reached Yarkand in nineteen days. They then went on to Khotan and rested there, meanwhile studying the Turkish and Chinese languages.

January 2, 1903 they set out again and spent twenty-three days following the Khotan Daria to Ak-su. From Ak-su they returned to Kashgar for re-outfitting and then set out for Kucha via Ak-su and Bai. This trip took two months. They then spent three months at Kucha, exploring all neighboring sites. They visited seven temples or Min-ui ("Thousand houses") and then set out for Urumchi with the material they had excavated and packed.[7] The collection of manu-

[5] *GJ*, 23 (1904), 516.
[6] R. D. Oldham, in *Nature*, 67 (November 6, 1902), 8–9.
[7] *GJ*, 22 (1903), 566–567.

scripts constituted the most valuable finds. These manuscripts are mostly in the museum of the University of Kyoto at present.[8]

As early as 1892 Gottfried Merzbacher took a short trip to the central Tien Shan, but details of the journey are vague. However, the lectures of the Tien Shan pioneers, like P. Semënov, and the reports of his followers N. A. Severtsov and J. V. Mushkétov, kept Merzbacher's interest alive. Ten years later he realized his desire to return for further investigative work. He laid the groundwork in St. Petersburg in 1902, when he enlisted the active help of Grand Duke Nikolai Michailovich, the first President of the Russian Imperial Geographical Society, and of Senator P. P. Semënov. This aid enabled him to start that same year. The secretary of that society, Professor Grigoriev, made the rich Russian literature on the area available to him for study and showed him that one summer would not suffice to overcome the widespread, inaccessible, high regions of the central Tien Shan. He saw that he would have to devote two years at least to it.

Persevering Russian explorers had enriched our knowledge of the orography, the geological structure, fauna, and flora; meantime knowledge of the Tien Shan glaciers had come mostly through the fruitful expeditions of A. W. V. Kaulbar, J. W. Ignatiev, and A. N. Krasnov. Still, the world knew little of the largest glaciers for lack of close and detailed study. Merzbacher therefore took along the foremost Alpinist, Engineer, Hans Pfann of Munich. To help in the geological study, he took along a geology student, Hans Keidel.

After a feverish effort to get started that same year, Merzbacher left Munich with these two companions on May 15, 1902. In Vienna they picked up a mountain guide, Franz Kostner of Corvara, as they had previously arranged, and continued to Odessa, where they collected most of the equipment. The Russian Treasury furnished the instruments. During the preparation the group enjoyed lodging and the hospitality of the famous traveller M. v. Déchy and of the Krim-Caucasian Mountain Club, especially that of its President, Professor Ilovaiski.

On May 25 they landed in Batum and continued to Tiflis, where they paused to pick up the latest maps and had their instruments tested by the observatory. Here Merzbacher also personally met Grand Duke

[8] One of the writer's students visited Kyoto in 1955 and inquired about the manuscripts. He reported seeing them stored in bundles in the archives of the University of Kyoto. Not being linguistically qualified, he could not make any identifications.

Michailovich, President of the Society. Here E. Russel, a student from Pyatigorsk, joined them.

The expedition continued to Krasnovodsk, then by rail to Tashkent, where Governor General of Turkestan Lieutenant General Ivanov welcomed them and helped avoid delays in obtaining the necessary papers for the trip. Here they divided their equipment and preserved foods. They forwarded to Kashgar the part selected for the second year.

They left Pishpek June 18 for Vernyi to obtain further papers from Lieutenant General Jonov, Governor of Semiretchenski Province. In the meantime Kostner and Russel continued to Przhevalsk with the mass of the baggage.

June 24 they met again in Tokmak; then they continued along the Issyk-Kul to Przhevalsk, where they met other explorers, Soposhnikov from Tomsk, Max Friederichsen of Hamburg, and Giulio Brocherel. At first Merzbacher tried to get them to join his expedition, but they did not because their program called for spending only a few days in the Sari Dschasz Valley, at the foot of the glacier, then returning without taking time for a close study.

From Przhevalsk they continued on horseback to Naryn Kul on the border of Chinese territory. There the expedition entered the upper part of the Tekes.

On July 9 they reached the first part of the chain of the Central Tien Shan at Staniza Naryn Kol. Keidel busied himself with the study of the Tertiary forms of the Teke plain and the chain of carboniferous chalk in the south. On July 10 Merzbacher with Pfann, Kastner, and a Cossack, made his first attack on the mountains. They moved south through a valley called Mukur-Mutu. Between the large and small Muzart Rivers they found errors in previous locations given the Khan Tengri and worked to rectify them. The next several months they spent in a careful study of the mountains, the Semënov Glacier, and the whole of the Muzart Valley. They then crossed the mountain to the south slopes and set out for Kashgar, the city that a few months before, August, 1902, had suffered heavily from earthquakes. In places they noted little mud volcanoes. Even during their stay in Kashgar they felt minor quakes almost each day.

From Kashgar Keidel made several trips to study the loess and the southern edge of the Kashgar basin. At Tashmalik he found a rich deposit of fossil fauna. Then he continued into the Ges Valley and Ak-tschiü, where he found a coal deposit which the Kirghiz worked very crudely and where he found a quantity of fossil plants of the

Angara Series. He returned via Eski and Yangi-Hissar. In February Keidel made another trip to Bash-Sugun to complete the Paleontological collection by research in another horizon in the chalk deposits.

Having suffered an accident that destroyed many of his photographic plates, Merzbacher had to return to Tashkent for extra equipment, and he also brought back a mountaineer, Sigmund Stockmayer from Neukirchen, and two young Cossacks as escort. By April 13, 1903 the expedition again set out. Merzbacher had also added to the expedition a student named Maurer. The Cossacks were Besparadov and Sienin, and they had several Sart helpers and horsemen. Later the Cossack Tschernow (Chernov), who had already been on an expedition with Sven Hedin, joined them. The Russian Consul General in Kashgar, N. F. Petrovski, had sent word ahead, and they experienced no difficulty with the Chinese garrisons.

The party followed the south edge of the mountain to study the geology, since the scientific world knew practically nothing of that part of the Tien Shan. They proceeded from Altyn-Artysh, Tangitar, and Bash Sugun, intending to try the Karabel Pass in the Aiktyk Valley. They found more errors in existing maps of this area. At Kara-Dschil they crossed the path followed by Sven Hedin in 1895.

Once back in the mountains, they studied the Sabavtschö Glacier, the Inyltshek Glacier, the Semënov Glacier again, the Mushkétov Glacier, the Kaündü Glacier, and the Muzart Valley. The expedition returned west by very much the same route as they had entered, from Naryn-Kul, Kuldja, to Tashkent and Europe.[9] They had visited, surveyed, and described just about every glacier in the range, and they had measured the height of the great peak of Khan-Tengri (23,622 feet). They decided that this dominating peak, despite its altitude, was not the core of the range; they placed the nucleus in an area classified as a "marble wall" and named Mount Nicholas Mikhailovitch, after the president of the Imperial Geographical Society. This expedition made use of photographic equipment to a far greater extent than any before this time.

The Americans entered the stage at this time again, with an expedition of geologists whose studies divided the Pamirs, Turkestan, and the Caspian region between R. W. Pumpelly, W. M. Davis, and Ellsworth

[9] Merzbacher, "Vorläufiger Bericht . . ."; *idem, The Central Tian Shan Mountains*; Frederichsen, "Forschungsreise in den Zentralen Tiën-Schan und Dzungarischen Ala-Tau"; Keidel, "Geol.-Übersicht über den Bau des Zentralen Tian-Schan."

Huntington. The signs of deserted cities and the increasing dessication of the land impressed them. The Tien Shan Mountains they considered very old and attributed their existing irregularity to recent uplifts rather than to denudation. Pumpelly believed that Karakol Lake in the Pamirs rose to 320 feet above its present (1903) level during the first glacial period and to 150 feet in the second. He found signs of moraines in the Alai Valley. Huntington believed he found signs of five glacial periods, perhaps a sixth.[10]

Huntington, the most imaginative of the group, saw much in the effect of climatic change on the inhabitants, the descent from mountain-top through gravel rings to the plains, and the varying provision for habitation. After publishing the official reports, he produced a more interpretative study in the book that has proved the most popular on the subject in America to the present day – *The Pulse of Asia.*

His route led from Przhevalsk over the Tien Shan Plateau to Chadir Kul, which he reached August 6, then south among the mountains to Shor-Kul, then to Kashgar. The return journey went between the Tien Shan and the Alai Ranges, through the Terek Pass (12,700 feet), then to Osh. Later on he went to Karategin and Marghilan and the railroad. He had examined 10 passes, all over 12,000 feet high. He found many evidences of a Quaternary Glacial Period, but only at high altitudes. In recent history he found evidence of climatic oscillation between wet and dry.[11]

June 1, 1903 Mr. Oscar T. Crosby set out for Tibet, travelling from England overland and by train through Russian territory. On the way he met Captain Fernand Anginieur of the French Army, and the two joined forces for the expedition. They organized a caravan at Osh and travelled the usual road to Kashgar, crossing the border at Taldyk Pass. In Kashgar they enjoyed the hospitality both of Russian Consul Petrovski and of the British representative, Colonel Philip Miles. He also gained the company of Father Hendricks for part of his journey. They proceeded to Yarkand, Khotan, and to Polu, well enough; but then a series of misfortunes overtook them. They lost their grain in a mountain river; the guide deserted them; their ponies died, and Anginieur fell ill. They then lost the road to Rudok. When they finally received help, they had to return and turn south by the Karakoram Pass and then go to Leh. Their contribution to geography consisted of a trip across the Ak-sai Chin to the upper Karakash River, which no European had visited for several years.[12]

[10] *Nature*, 72 (August 17, 1905), 366–367.

[11] Huntington, "A Geologic and Physiographic Reconnaissance in Central Turkestan," in Pumpelly, *Explorations in Turkestan*, 157–216; *idem*, "The New Province Two Thousand Years Old"; *Science*, N.S. 20 (July 8, 1904), 60–61.

Lord Osborne Beauclerk in 1904 organized a hunting trip to Kuldja; evidently entering from the rail junction in Siberia, he took a tarantass which in twelve days reached Kuldja. There he outfitted a caravan and travelled nine days to the Kos-su River, covering some of the ground already crossed by Littledale and Crosby. He met Merzbacher in Tashkent on his way home.[13]

In 1903 the German scientists, not at all ready to accept the primacy of English archaeological discoveries, sent to Chinese Turkestan Professor Albert Grünwedel of the Berlin Ethnological Museum and his assistant G. Huth, who specialized in ethnography. They departed Berlin on August 11, 1902, evidently entered the Turkestan at Kuldja and came south to Turfan, where they established headquarters. They immediately began to work in the vicinity of Turfan and began a series of excavations that produced a large quantity of manuscripts and art treasures. When Grünwedel had made a considerable collection, he left to return to Berlin, March, 1903, with 46 chests full of his finds.[14]

While this expedition covered little ground as compared with those of earlier years, its aim was archaeological, not geographical. However, within the relatively small space about Turfan the intensity of the work far outshadowed anything done before. They mapped each cave in detail, showing the location of each manuscript and object uncovered or discovered.[15]

When the value of this collection became known in Germany, enthusiasm rose for a second expedition. The main backing came from Sanskritist H. Pischel, Historian Edward Meyer, Linguist F. W. K. Müller, and Orientalist Eduard Sachau. Financial support of 32,000 marks came partly from Friedrich Krupp again, with about a third

[12] Oscar T. Crosby, "Turkestan and a Corner of Tibet," in *GJ*, 23 (1904), 705–722; *idem*, "England and Russia in Thibet."

[13] *GJ*, 23 (1904), 721.

[14] Le Coq, *Buried Treasures of Chinese Turkestan*, 25; Grünwedel, *Bericht*, 1, 180. This expedition was privately financed, mostly by James Simon of Berlin and by Friedrich Krupp. In his *Bericht* Grünwedel also acknowledged help from other Europeans in the area: Consul General Fëdorov in Kuldja, Consul Krotkov in Urumchi, Petrovski in Kashgar, British agent Miles in Kashgar; and Swedish missionaries in Kashgar, Anderson and Backlund. At first this expedition had no name; but as later expeditions followed in numerical sequence, it came to be the First German Turfan Expedition.

[15] Grünwedel, *Bericht*.

furnished from funds available to the Kaiser, who maintained a personal interest in the venture. Dr. Albert von Le Coq was placed in charge. With Theodor Bartus as assistant, he travelled by train to St. Petersburg for the necessary papers. Then they continued to Omsk by rail, from Omsk to Semipalatinsk by boat, and thence by tarantass to Bakhty, Urumchi, and on to Turfan and Kara-Khoja, where they arrived in November, 1904.[16]

This part of the expedition spent nine months excavating caves and stupas. Out of the abundant finds they sent several hundred boxes back to Berlin, most of them with statutes showing Greek and Indian influences; but they also sent numerous coins and many manuscripts in a wide variety of languages. In October, 1905 Le Coq and Bartus left for Kashgar, where on December 6, 1905 they met Grünwedel returning; and this time he brought Pohrt as companion. They had come from Berlin via Russian Turkestan and Irkeshtam to Kashgar. The group then united to return to Kucha and Turfan and undertake further excavation.[17]

In 1904 and 1905 another small expedition, led by Count Lesdains and his bride, crossed Chinese Turkestan from Pe-king to India and back to Europe. They made it a sort of wedding trip. The group left Pe-king June 20, 1904, crossed southern Mongolia and the Gobi, visited the ruins about Ordos, and visited the grottoes of Yung-yang-miao. They crossed the upper Hoang-ho into Alashan, and there examined ancient tombs and other remains, *e.g.* the tomb of Genghis Khan at Edchen Koro. This tomb, he reported, was so jealously guarded that hitherto no European had seen it nor even discovered its actual site. He evidently erred in this because C. E. Bonin visited the tomb in 1896, and Yule reported that two Belgian missionaries, Vas and Verlinden, also had seen it.[18]

Turning north, they left Kan-su and again entered the Alashan area and the Gobi, where they visited Lake Tsin-tiu-ru. At Ngansi they prepared to cross Tibet and started out with sixty mules and ten drivers, ten horses, and four camels. They crossed part of the Tsaidam, noting particularly the Daba Sun Nor, and then went on to the sources of the Yang-tze. They then crossed the Amdo Mountains and went on to Tengri Nor, then Shigatse, where Captain O'Connor, the British Resident, met and entertained them. They then went on to Sikkim,

[16] Le Coq, *Buried Treasures of Chinese Turkestan*, 43–57.
[17] *Ibid.*, 113–114; *GJ*, 27 (1906), 303.
[18] *GJ*, 31 (1908), 441–442; *GJ*, 32 (1908), 295–296.

where they met Mr. Claude White, the British Political Agent. From there they continued to India and to Europe.

Continuing the exploring tradition, which had suffered in the rush for archaeological work, Major C. D. Bruce and his companion Captain Layard set out in the fall of 1905 to make a detailed route survey from Leh to Pe-king and gather other information of scientific interest. For the survey they took along a Sikh, Lal Singh, borrowed from the Survey of India. From Leh they travelled northeast to Lanak-La, then around the Ak-sai Chin and up to Keriya, followed the old Silk Road to Cherchen, Charklik, the Kara-Nor, the Bulungir River to Su-chow, Lan-chow, and reached Pe-king, early in 1906. Along the way Bruce noted a number of ruined buildings but did little excavating. The journey covered little new territory but did fix the survey better than before because Captain Deasy did not use the survey figures in Leh for his own plane-table work.[19]

As an aftermath of the Pumpelly Expedition to Central Asia Ellsworth Huntington, accompanied by R. L. Barrett, set out on a new expedition under the auspices of the Association of American Geographers to examine the climate of the Turkestan further. He sailed to England and to India, then started his expedition proper from Leh. Passing from Leh to the Karakoram Pass, he continued to Khotan, where the couple paused to study the geology of the southern Tarim Basin.[20]

After examining this area and that about Lake Pang-kong-su in northern Tibet, both geologists agreed with Hedin and Stein that there had been a dessication of the region.

At Keriya the two travellers parted company, and Huntington went around the east side of Lob-Nor. They passed Charklik, Tikkenlik, and the Kuruk-tagh Mountains to Karashahr, where he found a number of buried, ruined cities. Then Huntington visited the Turfan region and began the return journey.

That same year, Professor Vladimir Obruchev of the Technological Institute in Tomsk left August, 1905 for an expedition in the Tarba-

[19] C. D. Bruce, "A Journey across Asia . . . ," in *GJ*, 29 (1907), 598–626 and map. Since Deasy's time the survey of India had pushed ahead with standard work in the great network, thanks primarily to Captain Rawlings and Lieutenant Hargreaves of the Somerset Light Infantry, who moved their surveys into Kashmir in October, 1903 and carried their work as far as 85° E and 35° 45′ N – *Nature*, 69 (November 10, 1903), 61.
[20] Huntington, letter, Keriya, October 9, 1905 in *GJ*, 27 (1906), 177–179; *GJ*, 25 (1905), 327; *GJ*, 26 (1905), 451; *GJ*, 27 (1906), 627–628; *GJ*, 29 (1907), 674; *PM*, 52 (1906), 71.

gatai. He already had achieved some fame as an explorer on previous expeditions. This time his two sons and two other students accompanied him. They entered the Chuguchak area and continued south to the Barlyk Range, Maili, and Ebi-Nor. They spent considerable time about Zaizan Nor. In spite of the relatively easy access of this area and its nearness to the Russian border, scientists had studied it less than they had the distant, desert, and forbidding Tibet. Urkashar and Kadjur in 1906 were quite unknown, and Djair and Semis-tai only rarely visited. From the reports of the travellers of the 19th century the topographer Matussovski was the first to bring out maps of this, the Chuguchak area. In 1871 he made a sketch route map of Saissansk over the Emil Valley to Manass. His sketch clearly shows the post road from Durbuldjin to Shi-ho over the Djair, taken from existing maps. Some years later Captain Sosnovski, during his expedition to Bulun Tochoi passed the Kobu Valley from the Lama cloister Mateni to Lake Uliungur and saw the Semis-tai from the north. He then continued his way and described the valley in detail. Except for these few inconclusive reports, the area was relatively unknown.

Far from defining the area, this expedition only pointed out some of the work needed. Obruchev found evidence of extensive Carboniferous formations, some Devonian. He identified the *Hanhai* strata, typical of Central Asia but found it very poor in fossil life. He concluded that the Saur and Tarbagatai Ranges were not directly connected but that a deep, rift valley separated them. He found signs that glaciers six to nine miles long once occupied each of the southern valleys, although at present only scattered patches or small "saddle" glaciers remained. He found many moraines and cirques, showing more extensive glaciation on the north side in earlier times. The Tarbagatai showed less glaciation than the Saur Range.[21]

Seeing that the summer did not nearly give enough time for completing the study, Obruchev returned to Tomsk to prepare for another trip. The next summer he did return, in 1906, to this same area to complete his researches along the border of Chinese Dzungaria, particularly the ranges of Kojur, Urkashar, Semis-tai, and Jair and their valleys.[22]

The year 1906 was active for operations in Chinese Turkestan. In January an English political agent, David Fraser, travelled through

[21] *PM*, 52 (1906), 143; *PM*, 53 (1907), 24; Obruchev, "Reise in Djair, Urkashar and Ssemesstai im Sommer 1906," in *PM*, 54 (1908), 25; *GJ*, 28 (1906), 180.
[22] *GJ*, 29 (1907), 457; *GJ*, 31 (1908), 673–674.

the area in part, though with his attention directed toward Tibet, where he studied the political history and economic geography. Leaving from Calcutta, Gartok, and Phari, he went on to Shigatse with the Tashi Lama, returned to Simla, then on a new expedition, entered Turkestan. His route led through the Karakoram Pass to Khotan, Yarkand, and Kashgar, then continued via the Terek Pass to Kokand, Teheran, and finally on to London, which he reached in January, 1907.[23]

The year 1906 was the first break since 1903 in the continuing excavations by German archaeologists at Turfan. With the return of Grünwedel four scientists were at work at once in the area. The quantity of manuscripts and art treasures that they found well rewarded their efforts.[24] Finally in 1905 Grünwedel returned to Kashgar with

[23] *GJ*, 31 (1908), 318–320.
[24] In subsequent years partial inventories have appeared of the antiquarian treasures obtained by these expeditions. Mostly the figurines and wall paintings went to Berlin museums. The manuscripts went to the Akademie der Wissenschaften in Berlin, where scholars began to work on them almost immediately. Besides many Buddhist texts in Sanskrit, there appeared other documents, mostly fragmentary, unfortunately, in languages unknown before or known only by name. Examples are Sogdian (a development of the Iranian family), Tocharian (a challenged identification divided into two dialects, A and B, for which later on scholars have mostly preferred the names of the places where they were found – Kuchean and Turfanian or Karashahrian, etc.), Manichean texts in Estrangelo writing, Syriac writing brought from the Middle East, forms of Turkic, at least one fragment identified to this writer by the person in charge in 1947 as the language of the White Hephthalites, and one fragment which enthusiastic scholars have preferred to call the "Real Tocharian," that is, from a western-based ethnic group.

The Tocharian manuscripts seemed to offer the greatest challenge to linguists and orientalists. From their first contact with them two German scholars, Emil Sieg and Wilhelm Siegling, both with strong background in Sanskrit, turned nearly all their professional attention to the study of the language, that is, from about 1907 to their death (Siegling, 1946 and Sieg, 1950). In 1948 I compiled a bibliography of books and articles written about the "Tocharian" language. It was far from complete, but it contained 242 entries. Since then Ernst Schwentner has produced a new and, if possible, complete survey of work done on this language (see Bibliography). It contains 526 entries, to say nothing of the reviews included with each main entry! I know of no similar summary of work done on Sogdian nor the Sanskrit texts.

These manuscripts were protected by being placed between two pieces of glass and bound at the edge with tape. The identification was written on pieces of paper pasted to the glass. Of course the identification (T III.21, etc.) was also written on the MS itself, probably at the time of excavation. In 1945, in anticipation of widespread destruction in the city, governmental/museum authorities loaded these MSS into wooden boxes for evacuation from Berlin. The evacuation had barely started when the city was overrun and the transports stopped. Unfortunately these wooden boxes resembled those which the German Army used

200 packing cases full of finds, which he then forwarded to Berlin by rail from that center. From Kashgar Le Coq and Bartus continued on to India while Grünwedel went back to the Turfan area for more operations. Le Coq and Bartus carried with them over the Himalayas and the Karakoram Pass into India thirty cases of other material to accompany them personally on the return trip.[25]

We can find a reason for the concern of the Germans to keep the work going continually in the intense rivalry that existed at that time between the Germans and the Russians. If they left Turfan very long, the Russians (Radlov, Berezovski), who were digging nearby in Kucha, would certainly move into the area. This intense rivalry we also noted on the political level in the 19th century between England and Russia, but both sides handled it on a formal and polite level in personal contacts. If the British-Russian rivalry continued in the field of archaeology, the participants did not document it as well as they did the German-Russian rivalry.[26]

Sven Hedin's Third Expedition in the area, planned for 1905, actually started in 1906. This expedition barely touched the area here in question; it mainly involved an exploration of Tibet. Returning from Europe through Asia Minor, Hedin crossed Iran and the Sistan to Leh. There he organized the strongest caravan he had used so far, 25 men and 94 ponies and mules. His party included Babu Rabat, who helped with scientific observations; Mohammed Isa, Caravanbashi, who had been on travels with Younghusband and who had been in the Dutreuil de Rhins expedition at the time of Rhins' murder. He had also travelled with Rawlings and Ryder in Tibet in 1905 and even earlier had served with Carey and Dalgleish. Hedin also took along

for ammunition supply, and the soldiers reportedly fired into the boxes, evidently hoping to explode them. Fortunately they soon desisted when they saw their error. The boxes were then returned to the Akademie der Wissenschaften, which is in the "East" side of Berlin. Some damage had been done, but partly it is attributable to the glass coverings. When the glass is broken, it also frequently tears the MS between the plates. By 1948, when I saw and handled the manuscripts, they were partly back in order, thanks to the efforts of Professor Hartmann and his subordinates. By 1951 or so German scholars again had access to the MSS for study.

[25] *GJ*, 29 (1907), 224 quoting article from *Times of India*, January 3, 1907; *Nature*, 75 (December 17, 1906), 155–156; *Nature*, 75 (January 10, 1907), 248; *Le Coq* (Obituary) by Pelliot in *T'oung-Pao*, Ser. 2, 27 (1930), 241–243, by Otto Straus in *OLZ* (*Orientalistische Literatur-Zeitung*), 33 (June, 1930), 393–398, bibliography, 395–398, by Ernst Waldschmidt in *OZ* (*Ostasiatische Zeitschrift*), 6 (1930), 145–149.

[26] Le Coq, *Buried Treasures of Chinese Turkestan*, 120–121.

Guffaru, who had served with Forsyth thirty-three years before.

At Leh he encountered difficulties with the Indian government over permission to enter Tibet, which was then under strong British, not Chinese, influence. He therefore changed his plans and headed for Chinese Turkestan. Setting out from Simla, he went through Srinagar, where he organized his party. In the meantime the Swedish minister in London obtained and forwarded a Chinese passport for Turkestan. The ruse was obvious, but a mix-up in government communications operated to his advantage, and Hedin managed to start out before new instructions could delay him.

Hedin left Leh August 14, 1906, crossed the Marsemik-La and the Karakoram, varying between the routes of Bower, Rhins, and Deasy. When he reached Shigatse, he rested and then began a rather detailed exploration of Tibet itself. He then returned via Leh.[27] Unfortunately it was Mohammed Isa's last journey. He died of a stroke during the trip.[28] This trip also ended Hedin's travel for several years.

In 1906 news of the archaeological discoveries in Central Asia likewise stirred the French. The Minister of Public Instruction, the Société de Géographie de Paris, and the Académie des Inscriptions et Belles Lettres joined to send an expedition to take part in despoiling the sands of their treasure. More formally stated, the purpose was primarily to examine the ruins for evidence of inscriptions for the period of Turko-Buddhist dynasties. To head the expedition they chose a leading French Orientalist, Paul Pelliot, Professor of Chinese at the École française d'Extrême Orient at Hanoi. The expedition also found support in an association founded in Russia to encourage exploration of Central Asia. After spending a year in preparation, the group left Paris June 17, 1906. They followed the railroad and post road across Russia to Kashgar, which they reached in August. By then the party included Dr. Vaillant of the Colonial Army, who made topographical observations, calculated astronomical positions, and collected natural objects for the expedition.[29] A M. Nouvette took photographs. They

[27] C. H. D. Ryder, "Dr. Sven Hedin's Expedition in Tibet," *GJ*, 32 (1908), 585–590; Sven Hedin, "Journeys in Tibet, 1906–1908," *GJ*, 33 (1909), 353–440; Sven Hedin, *Transhimalaja*; *GJ*, 26 (1905), 554; *GJ*, 29 (1907), 344, 456, 539–545 (Letter, Shigatse, February 20, 1907); *GJ*, 30 (1907), 559–560; *GJ*, 31 (1908), 333–334 (Letter, Gartok, October 7, 1907); *GJ*, 32 (1908), 3, 306, 426–427 and map; *Scientific American Supplement* No. 1751, 68 (July 24, 1909), 58 reprint from *Nature*, No. 2065, 80 (May 27, 1909), 372–373; *PM* (1908).

[28] Hedin, *My Life as an Explorer*, 453.

[29] *GJ*, 27 (1906), 87; *GJ*, 29 (1907), 87, 224; *Bulletin du comité de l'Asie française* (October, 1905); *La Géographie* (November, 1905).

moved from Kashgar northeast via Maralbashi, Ak-su, Bai, the Tekes Valley, and on to Kucha. At Kucha and Karashahr they remained for eight months and dug from the caves and sites already visited by Germans, Russians, and Japanese. In spite of their late arrival, Pelliot found a great mass of valuable manuscripts and art treasures. The expedition then proceeded to Urumchi, Turfan, Hami, Su-chow, and western Kan-su for the study of the famous Caves of the Thousand Buddhas at Tun-hwang. Although Stein had already removed much of the contents of the caves, Pelliot still obtained a large quantity of manuscripts there, also, in Chinese, Mongol, Tibetan, Uighur, and Brahmi writing, from the same sources. The expedition then continued to Lan-chow, Singan-fu, and by rail to Pe-king and by sea back to Paris.[30]

Dr. Vaillant prepared a map of his route, 2,000 kilometers, and secured 25 astronomical observations.[31] The Natural History collection had 800 plants, 200 birds, many mammals and insects, and numerous anthropological measurements. The manuscripts were of utmost significance and placed French linguists in a position comparable with those of England and Germany in the progress of linguistic history. The manuscripts are now mostly stored in the Bibliothèque Nationale.[32]

That same year Erich Zugmayer, an Austrian zoologist from Munich, set out for his own observations in the area. He reached Kashgar April 12, 1906, travelling to Tashkent on the newly opened Trans-Aral Railway. He left for Khotan April 28 and on June 5 departed Khotan for Kizil-davan. In this area he conducted a survey, made astronomical observations, and kept a meteorological record. June 22 he reached the Tibetan Plateau and Sagüs Kul. Along the way he passed Keriya and Polu. From Keriya he sent back three cases of his collection of Natural History specimens, and there he left part of his baggage. Then he reached Yeshil-Kul and Arport Tso but could not find yaks for

[30] *Paul Pelliot* (Obituary) in *T'oung-pao*, Ser. 2, 38 (1948), 1–15.

[31] *GJ*, 35 (1910); *La Géographie* (January, 1910); Lafitte "La Mission Pelliot."

[32] These manuscripts, at least those in Kuchean or "Tocharian B", were removed from Paris in 1941 for safekeeping; but by 1947, when this writer visited the Bibliothèque Nationale and saw them, they had been returned but were still in boxes and were still partly unidentified. Since the Pelliot Collection at the Bibliothèque Nationale was only inadequately catalogued, it will be long before we learn whether any are missing. At any rate the Kuchean MSS are better preserved because each MS was originally (1908) placed between two pieces of heavy celluloid and bound at the edge with cloth tape. They weigh much less and are more easily handled than those enclosed in glass. I recommend this treatment for the protection of such MSS.

his baggage. When he pushed east, Rudok officials stopped him by force. He therefore gave up the journey and made his way via Pangong Lake to Leh. He returned with only 12 of the 60 animals with which he had started. He had pictures of many young volcanos and a rich zoological collection.[33]

By the summer of 1904 the success of Stein's first journey led him to submit to the Government of India proposals for a new expedition. Through the benign influence of Viceroy Lord Curzon final approval came in 1905 when the British Museum offered to pay two-fifths of the estimated cost. In April, 1906 Stein prepared to leave Kashmir, where he had been finishing work on *Ancient Khotan*. April 28, 1906 he left from Fort Chakdara, with Rai Ram Singh again and a technician corporal, Naik Ram Singh, and Cook Jasvant Singh, who had travelled with Major Ryder in Tibet. The equipment consisted of scientific instruments, photographic plates, and a portable raft, all carried by 14 mules.

May 3 he passed the dreaded Lowarai Pass to Chitral, and May 19 he passed the Hindu Kush range and marched up the Oxus to Wakhjir Pass, then down to Taghdumbash Pamir, Tash-kurgan, and Kashgar, which he reached June 8.

As before, Stein spent two weeks preparing for the next stage of the journey. June 23 he set out for Khotan but finally set up headquarters at Kök-yar, where he made many anthropological measurements on local inhabitants. In July he went on to Khotan. Here again he took time to carry the previous survey farther south of Khotan than he had on the previous expedition, particularly in the Nissa Valley and the Pisha Valley.

In September he returned to Khotan, where he examined various offerings of antiquities brought in by neighbors. He then set out again to retrace the outlines of Rawak stupa, which was again buried in the sand. Again he found various items of art work. He then passed on to Hanguya Tati and the tract of Domoko on the road to Keriya. There he found that his old guide Ahmad had been finding "old papers" and selling them in the market in Khotan. Stein went to this site and began to excavate. Under a large Buddhist temple he found a large number of manuscript leaves in Sanskrit, Chinese, and the "Unknown" lan-

[33] Zugmayer, "Reise von Taschkent nach Tibet 1906" in *PM*, 52 (1906), 71, 120, 143, 263; *GJ*, 29 (1907), 87, 223; *GJ*, 33 (1909), 313–314; *Mitteilungen*, Vienna Geographical Society, 49 (1906?), 441.

guage of Khotan, and wooden tablets, in Tibetan and Khotanese. They evidently dated from the 8th century.

At Niya, which Stein reached in October, he found the workers who had helped him in 1901. He set out again with a caravan of 50 men past the shrine of Imam Safar Sadik to the Niya site. Again he found wooden tablets with inscriptions, many Kharoṣṭhi documents, coins, as well as remnants of various kinds of cloth. In one large building they found a whole set of Kharoṣṭhi records and a cellar with a whole archive. All gave evidence of a sudden destruction – not an abandonment of the old city.

In November Stein left Niya for Endere and Charklik, which Stein believed was the real site of old Lou-lan. There Stein proposed to visit the old city first reported and studied by Sven Hedin near the edge of Lob-Nor. Before setting out, however, he took time to look over Miran, where Bonin had found interesting manuscripts. There he found mostly Tibetan records, but all evidence indicated that in the past a whole Indian Empire, unknown to modern historians had existed in the area and that its limits ranged as far as Lob-Nor.

On December 17 he found the ruins mapped by Hedin, and he spent eleven days excavating there. He found many manuscripts on both paper and silk. Finally illness and lack of water caused the excavation to halt. The finds there consisted mostly of Chinese manuscripts, with some Kharoṣṭhi writing.

Stein then returned to Charklik and went on to Miran again. This time he found besides Tibetan Manuscripts others in Kök-Turki, the earliest type of Turkish writing.

After spending several days at Miran, Stein returned to Abdal to give his helpers a rest from the severe exposure they had suffered. Stein spent the next two weeks packing his discoveries of the last four months. Finally, February 21, 1907, he started northeast on the journey to Kan-su and Tun-hwang, a key city on the Old Silk Route, which had been abandoned and forgotten during the period of Chinese seclusion but which was being reopened in the 20th century as the oases of Turkestan began to revive their trade. He passed Kara-Nor and found evidence of an old Chinese wall discarded and forgotten. By following these traces, he was able to reconstruct a section of a defensive wall quite apart from the more famous Great Wall. Searching along the sides of the ruins, he also found a variety of items, such as bamboo, silk, clothes, furniture, and even military records.

Finally Stein turned back to the caves at Tun-hwang. These had

been reported as early as the Széchneny Expedition of 1879 by L. de Lóczy, who was on that expedition; and he had reminded Stein of the caves in 1902. Here he found a different situation. No abandoned stupas here, but active Buddhist temples cared for by priests and surrounded by partisans of that faith. However, it was known that a few years earlier a Taoist priest, while renovating one of the buildings, had happened upon a large store of manuscripts, which he walled up and jealously guarded, although he evidently did not realize the value of the manuscripts themselves. When Stein and his Chinese secretary, Chiang Ssŭ-yeh, approached the priest, they did so as great admirers of the traveller of the 8th century Hsüan Tsang, which they were indeed. The road was then open for more personal matters, and finally Stein obtained access to the hidden, underground room. It was heaped ten feet high with manuscript bundles.

An examination of some of the manuscripts showed both Chinese and Brahmi writing, and the subject matter to be Buddhist religious works. When Stein persuaded the priest to part with some of the bundles, he and his secretary spent several days looking them over and picking out the ones the priest was least loath to part with. Finally they finished the sorting and crating, and Stein not only rewarded the priest in silver but made a handsome contribution to remodeling the temple, and all parted on friendly terms.

Leaving Tun-hwang and the mountain with the Caves of the Thousand Buddhas, Stein then returned to the Great Wall and some of its continuations to study the archaeology of the sites. Passing Su-chow in July, he entered the uplands north of Kara-Nor and Koko-Nor and the Nan Shan, then continued via Hami to Turfan. He examined the ruins at Turfan during the interim between the excavations by the Germans and the Pelliot Expedition but then continued to Karashahr in December and there examined the group of shrines called Ming-Öi. He then returned to Turfan and found the whole area denuded by Pelliot, who had cleared out the archaeological material with a fine-tooth comb.

Hearing of other cities in the area of Niya, Stein decided to cross the Takla-Makan to them, an operation which Sven Hedin had proved feasible. However, Hedin had crossed from south to north, a very different thing from moving south with the hope of striking the Keriya River. Hedin's map and Stein's navigation, however, proved accurate; and after a very severe trip he struck the Keriya River near Tonguz-baste.

Stein then took up archaeological work again at Kara-dong and then a new area near Domoko. In this area the greater moisture content had caused more deterioration in the stupas; nonetheless he gathered a variety of manuscripts in several languages from the ruins.

Then Stein set out along the Khotan River for Ak-su and along the way found another abandoned fort with its collection of documents on wood and paper. They reached Ak-su in May. There and at Kelpin and Uch-Turfan he substituted anthropometric work for excavation. Then he returned to Khotan, leaving Lal-Singh to survey the area between Ak-su and Kashgar. On his return he found his aide Naik Ram Singh, who had been sent on a separate mission to Miran, had lost his eyesight. He was sent to Yarkand, where the Swedish Medical missionary Raquette, diagnosed the disease (not named) as incurable, and he was sent home to India. Later the Indian Government provided him with an adequate pension.

When Lal Singh returned from Kashgar, the party went south to the Yurung-kash Gorge, where they examined the old gold-mining sites at Zailik Valley, surveyed the valley and river system, and began a search for the route of communication used in 1865 by Habibullah to take Johnson to Khotan. It had not been used since that time, and it was no longer known. In this search, however, Stein overexposed himself in the cold and suffered several frozen toes. Then the need for medical attention led him to start back to Ladakh. A missionary from the Moravian mission at Leh amputated the toes of his right foot but saved the rest of the foot. Thus the Second Expedition ended.[34]

Stein and his aides had prepared a map on a scale of one inch to four miles, of the area covered; he had 8,000 manuscripts and crates of other finds. When Stein finally put all of his finds together, the detailed report of his expedition was published in three volumes.[35] In

[34] Stein, "Explorations in Central Asia, 1906–8" in *GJ*, 34 (1909), 5–36, 241–271; *GJ*, 28 (1906), 75–76; Stein, letter, Camp Miran, February 6, 1907, in *GJ*, 30 (1907), 71–77; *idem*, letter, Keriya, October 10, 1906, *GJ*, 29 (1907), 31–35; *idem*, letter, Kara-Shahr, December 10, 1907, in *GJ*, (1908), 509–514; *idem*, letter, An-Shi, Kan-su, June 18, 1907, in *GJ*, 30 (1907), 503–507; *idem*, letter, Khotan, July 15, 1908, in *GJ*, 32 (1908), 347–353; *idem*, letter, Leh, October 24, 1908, in *GJ*, 32 (1908), 598–599; *Nature*, 75 (December 20, 1906), 180, and (January 10, 1907), 248; *Nature*, 76 (August 1, 1907), 339–340; *Nature*, 78 (September 24, 1908), 513–514; *Nature*, 80 (March 11, 1909), 47; *Nature*, 81 (September 23, 1909), 368–369, with 3 photographs not shown elsewhere. See also Jean-Paul Lafitte, "Archéologie du Turkestan Chinoise," in *La Nature*, 41 (part 1) (1913), 21–26.

[35] Stein, *Serindia*.

further recognition of his work on this Second Expedition the Royal Geographical Society in 1909 awarded Stein the Founder's Medal and bestowed the Back Bequest upon his surveyor Rai Sahib Lal Singh.[36] Further, the Indian Government sent cordial acknowledgements to the Chinese Government for the help given Stein during his Second Expedition, and the Government of India likewise presented Stein's Chinese Secretary, Chiang Ssŭ-yeh, with a gold watch suitably inscribed. Stein, before leaving Turkestan, had arranged for a desirable position for Chiang with the British Residency in Kashgar. While both the Russians and British rewarded deserving subordinate members of the exploring expeditions, these rewards represent a high level of recognition. Comparison of the two nations is pointless in view of the different ethnic and political situation. Since expeditions from other nations depended on local employment or on the hospitality of the British or Russians, their system of rewards to their subordinates again cannot be compared.[37]

Early in 1907 a new geological expedition representing the German interest started to the Turkestan. Prince Arnulf of Bavaria, whose interest was mainly in hunting wild game, sponsored a trip to the Tien Shan, and to accompany it he invited Professor Merzbacher to go along with a staff of scientists. After the expedition had organized and started from Munich April 17, 1907 and reached Russian Turkestan, the Prince had to leave the group and return for medical attention for a lung infection that proved fatal. The rest of the expedition, however, continued and is known therefore as Merzbacher's Third Expedition.

The other members of the expedition were Geologist K. Leuchs, a mountain Guide Franz Kastner of Corvara in the Tyrol, who had already been with Merzbacher on his second expedition; a student zoologist P. Kockinger; and a hunter, Fritz Berger of Eisenerz in Steiermark. These members joined the expedition at Tashkent. Together they went on through Semirechensk to the Issyk-Kol and to Kuldja, where the rest of the expedition was organized.

Merzbacher was still looking for closer proof of the youthful development of the Tien Shan. This time he hoped to examine the eastern part of the Tien Shan and to draw the eastern ranges into the circle of his studies.

The expedition first worked on an exploration of the river system of the two great mountain-river systems, Kok-su and Agias. The

[36] *GJ*, 33 (1909), 593, 610.

[37] *GJ*, 33 (1909), 597.

peculiarity was that both rivers after flowing in a straight line for a long way, suddenly turn and enter the Teke. These valleys had been visited before by sportsmen in search of the Steinbock and wild sheep, but their experiences had little scientific significance.

This expedition followed the hydrographic system of both rivers and their main tributaries up to their source, which led to previously unknown glaciers. He found that they both stem from the many-fingered glaciers Say-dacha, Inyltschek, etc. The total mass of the ice-covered area was much greater than anticipated, especially at the source of the Agias. Some of the smaller glaciers, such as the Kopr-sai, which feeds the Agias tributary, have an unusually complicated construction.

Merzbacher then found that in the Kok-su area there was wide distribution of the young formations, red conglomerate, sandstone, clay, and marl. In many other places he found evidence of formations young in the geological sense.

He found widespread and well-preserved evidence of the Ice Age, which he had previously reported in 1905. He also found signs of inter-glacial periods and in the Mus-tamas Valley, stratified moraines. In the Agias Valley he found young moraines on top of older ones.

During this expedition he also examined some of the mountain ranges north of the Tekes River. The weather was especially bad in the summer of 1907, the worst in Merzbacher's four summers in the area; and he had only a relatively short time actually available for operations.[38]

In 1908 the Japanese returned to the scene. Zuicho Tachibana left Pe-king June 16, 1908, under the auspices and at the expense of Count Kozui Otani and assisted by Hasiramoto, a naturalist, and with the nominal leader of the group, B. Aoki. They passed via Urga, Uliassutai, Kobdo, Urumchi, to Turfan. After some study and excavation there, they went to Lob-Nor whence they made a side trip to the north to visit Lou-lan. Excavation there led to the discovery of some manuscripts from the 2nd century A.D. They continued via Cherchen, Keriya, and Khotan to Kashgar, which the group reached July 6, 1908. They then tried but failed to return east across the Tarim Basin. In Kashgar they collected a caravan and loaded it with objects dug up at Kucha. They crossed the Karakoram Pass and reached Leh October 27. They then returned by sea to Japan.[39]

[38] *PM*, 53 (1907), 215, 292; "Merzbachers neue Reise in Zentralasien," in *PM*, 54 (1908); *GJ*, 30 (1907), 332; *Geographische Zeitschrift*, (1907).*

[39] *PM*, 56 (1910 I), 208, 263–264; *GJ*, 35 (1910), 448–449.

Even while still active in his regiment, Kozlov had achieved considerable fame as an explorer and scientist by his various expeditions with Przhevalski; and he had continued after the death of his preceptor. In June, 1908 he led another of the very productive expeditions to eastern Turkestan. The expedition organized in Ala-shan, but it soon divided. Captain Napalkov followed one route via Kan-su to Si-ning, not previously mapped. The second group, under Geologist Chernov. made some detailed study of the Nan Shan and at the end of August joined the main party under Kozlov on the southern banks of the Koko-Nor. One of the principal purposes of this expedition was to set up a meteorological station at Koko-Nor.

August 31 Chernov and Botanist Chetyrkin started in a boat on the south bank for the little island of Kois-su or Tsau-yi in the middle of Koko-Nor. This was evidently the first time a boat had sailed these waters. On the island they found the only inhabitants to be three monks who lived by caring for a small herd of sheep and goats. Only in winter was communication with the mainland possible, and even then during some winters the water did not freeze over. Its depth was at most 38 meters.

September 10 they continued to Si-ning, rested for two weeks, then went to the monastery at Kum-bun, where they were old acquaintances, and Quetä (Kwei-to) on the south bank of the Hoang-ho, where they stayed three months. Then they continued to Labrang Monastery, which they entered January 28, 1909. On the way they were menaced by Tanguts and had to use their weapons. Labrang was the southernmost point of the expedition. From there they returned by way of Lan-chow, almost on the way to Alashan. Among the results were reports of ruins at Kara-khoto and finds there. Potanin had described these ruins twenty years before. The city belonged to the Hsihsia Kingdom, which included part of Kan-su, Shen-si, and East Turkestan and which was destroyed in 1226 by Genghis Khan. The finds indicate that the city must have existed as late as 1368.[40]

Continuing the work of Merzbacher, in the winter of 1908–1909 Dr. Paul Gröber of Strassburg and assistant in the Musée Royale d'Histoire Naturelle in Brussels undertook a geological and geographical trip to the southern Tien Shan in order to study the mountains between Kok-Shal and Kashgar-daria, already crossed by M. A. Stein.

[40] *PM*, 56 (1910 I), 208; *PM*, 55 (1909), 198; *Globus*, 94 (1908), No. 11; *Globus*, 95 (1909), No. 20; *GJ*, 30 (1907), 437; *GJ*, 31 (1908), 104; *GJ*, 32 (1908), 529; *Geographische Zeitschrift* (1908), No. 9.*

He had taken part in the Merzbacher Expedition to the Eastern Tien Shan in 1908 as geologist but returned at the end of October from Kuldja. He turned south and crossed the Tomurlik-tau in the Su-assu Pass, crossed the Tekes plain, crossed the Tien Shan, central ridge of the Muzart Pass, and reached the mouth of the southern Muzart River the middle of November, 1909. There he studied some of the larger valleys west of the Muzart, the Kurgoilik, the Kitschik, the Tschong-Kossubai Valleys, of which previously nothing had been known. Then he turned back to Ak-su and to Ak-jar (halfway between Ak-su and Uch-Turfan and there crossed the mountains to the south, to the southern Imperial highway from Ak-su to Kashgar, and reached Chul-Kuduk.

Here Gröber found quite a different orographic relationship from that shown on the Russian 40-vërst map (Kashgar Sheet). Then he went on to Kalpin, a small, administrative center, visited the Chul-dagh, which stretches in a west-southwest to north-east direction, and which is separated from the northern mountains by a wide field of desert, unlike the one shown on the 40-vërst map. Gröber then crossed the mountains between Kalpin and Uch-Turfan along the path followed by Stein, but often leaving it, and passed the Kara-teke Tagh at the Sekis Chanat davan. At Uch-Turfan he spent fourteen days studying the geology of the region. Then he returned to the route already followed by Merzbacher and Hedin up the Kok-Shaal to Safärbai and crossed the mountains via the Dungaret-nu Pass, thrice cutting across his earlier route from Kalpin to Uch-Turfan and touching it at Döne Masar. From Döne Masar he turned west to the north edge of the high plain of Chul-talasse and reached the mountains again via Kepening-bel Pass, in the area of Safärbai and Kok-Shal, which he followed up to Sumtasch in order to cross the mountains at Gulcha-bel and reach the west end of the Chul-talasse. He then turned westwards to Schor Köl and followed the plain which led toward the west.

The middle of March he reached Bash-sugun, Tongitar, Altyn-Artush, and Kashgar, sometimes crossing the path of Merzbacher. From Kashgar he passed through the Terek-davan by the caravan route and in April reached Osh, then Marghelan, and finally Germany again the end of April, 1909.

The maps that he brought helped the geological history of the area and had important results for the *Scharungs* theory and for the study of Tertiary mountain formation.[41]

[41] *PM*, 56 (1910 I), 147–148; *GJ*, 35 (1910), 721–722.

The competition for ancient manuscripts had also touched the Russians. As early as 1905 the Russian Foreign Ministry set up a committee for the exploration of Central and East Asia and sent out an expedition to Turfan under the outstanding linguist and Indologist Oldenburg to continue the researches of Berezovski. This and succeeding groups worked continuously for the next several years, sometimes near and even in conflict with the Germans at Turfan. One of these groups left St. Petersburg June, 1909 and reached Karashahr the middle of August. They then spent a month visiting the many Buddhist temples and caves with their surprisingly beautiful sculpture. They then went to the Turfan Oasis and studied the ruins of the old city of Idikut Shahri, which had about 100 caves. The end of February 1910 a professional painter, Dudin, left the expedition and returned to Russia with about 8,000 photographs, while Oldenburg continued to study the area about Lob-Nor and also met Grünwedel in the area. Oldenburg had a great deal of difficulty with the Chinese authorities. Finally Mining Engineer N. N. Smirnov, who was also in the expedition, led the return trip, and by March 24, 1910 the expedition had returned to St. Petersburg.[42]

An unusual addition to geographic knowledge was made in 1907–1908 by Cecil Clementi, Assistant Colonal Secretary in Hongkong. On his way to his post he travelled by rail across Russia to Andijan and crossed the Pamirs to Kashgar. From Kashgar on he used his watch and pocket chronometer to take astronomical readings every night that the weather permitted. From July 27, 1907 he travelled 198 days or 3,990 miles to Hongkong. His readings furnished an unusually full report on that aspect of the geography of the area.[43]

Obruchev, who had already spent two summers in the mountains of Dzungaria, returned to them in 1909 to study in more detail the Barlik, Maili, and Western Jair Ranges.[44]

In 1909 Lieutenant P. T. Etherton of the 39th Garhwal Rifles, in search of hunting and similar sport, followed the regular route, Gilgit, Hunza, Mintaka Pass, the Taghdumbash Pamir, to Kashgar, then north to Kuldja and to the railroad in Siberia. He kept near beaten paths, and he added little to geographical knowledge of the area.[45]

Colonel G. v. Mannerheim returned in 1909 after two years in

[42] *PM*, 55 (1909), 144; *PM*, 56 (1910 I), 208–263.
[43] *GJ*, 40 (1912), 624–628.
[44] *GJ*, 35 (1910), 722.
[45] Etherton, "Across the Roof of the World", *GJ*, 37 (1911), 649.

Central Asia, although the details of his trip and the dates are not clear. From Kashgar he had three times crossed the Tien Shan, crossed the Gobi to Lan-chow, Eastern Tibet, and then the Hoang-ho via Shan-si and on to Pe-king. He had mapped 1,000 kilometers of the route and made many anthropological measurements.[46]

The third Japanese effort to participate in the exploration and excavation of Chinese Turkestan began in 1910. Tachibana, who had already completed one trip to the area, returned to Urumchi in November, 1910 via Semipalatinsk, and then continued to Turfan and later on to Kara-Khoja. In the latter site he found many Buddhist texts and a mummy. He also dug at Yar-Khoto, or Chiao-ho. At Turfan Tachibana left his assistant Hobbs to move on to Kucha while he went south across the Kuruk Tagh to Lob-Nor to investigate the site of Lou-lan. For his trip across the desert he carried blocks of ice as other travellers had done.

On New Year's Day 1911, at Yakazuma, Tachibana met a guide who had worked with him on his previous expedition. They then passed Ab-dal and found many Buddhist relics and some jade stones in the Altyn Tagh. From Charklik the group crossed the dunes to Cherchen. From Cherchen Tachibana crossed the Takla-Makan to Kakto, fortunately surviving the very severe journey. He then went on to meet Hobbs, but Hobbs had in the meantime died, and his body was being carried to Kashgar. Tachibana respectfully followed the trail to Kashgar and arrived in time for the funeral. He then followed the old road to Khotan and did some archaeological work there where Stein had worked. He tried to enter Tibet via Polu, but the terrain proved to be too rough. He therefore gave up the attempt and followed the caravan route by Cherchen, Charklik, and the caravan route to Tunhwang in Kan-su, where he visited the "Cave of the Thousand Buddhas" and found a few manuscripts not taken by Stein and Pelliot.

On his return the Revolution in China had cut off ordinary transit, and Tachibana went back to Turfan, Urumchi, and Siberia, where he continued on the railroad.[47]

With the expedition of Tachibana and the political upheaval in China the period of archaeological discoveries and the despoiling of

[46] *PM*, 55 (1909), 144; "In Quest of a Buried Tibetan Empire"; Mannerheim, *Across Asia from West to East*.

[47] Tachibana, Z., "Exploration in Central Asia," in *Journal, Tokyo Geographical Society*, 24 (1912), 599–608, 682–698* [see *GJ*, 42 (1913), 306]; *GJ*, 43 (1914), 80–81.

Chinese Turkestan of its buried art work and manuscripts ceased. Since that time a few expeditions have found scattered items, but the great finds apparently are no more. The artistic works are now mostly in museums. The study and interpretation of the manuscripts, which had started with great fervor immediately upon their discovery, continued apace, adding immeasurably to linguistic science.[48]

[48] For a bibliography of Tocharian MSS, see Schwentner, *Tocharische Bibliographie 1890–1958*. For other languages represented, see *e.g.* H. W. Bailey, *Khotanese Texts* (Cambridge (University Press), 1945); E. Benveniste, *Vessantara Jataka. Texte sogdien* . . . (Paris (Paul Geuthner), 1946); Sten Konow, *Saka Studies* (Oslo (Etnografiske Museum), 1932); *Türkische Turfantexte* (Berlin (Akademie der Wissenschaften zu Berlin), *Abhandlungen*, a series, of which No. IX appeared in 1958).

VII – THE POLITICAL PERIOD: 1911 TO THE PRESENT

After the third Japanese Expedition the tone of exploration in Chinese Turkestan changed again. Except for one more expedition by Stein, archaeological interest waned, and finds grew fewer. Scientific interest began to become involved in more political relationships, mostly those growing out of the First World War.

Late in 1911 and early in 1912 a revolution against the Manchu Dynasty succeeded in driving the ruling family out and substituting a republic for the Empire. The revolutionary activity mostly took place in the littoral provinces. In Sin-kiang the change was relatively peaceful. The Governor or Viceroy turned over power to one of the Secretaries, Yang Chun-Shun (Yang Tseng-Hsin), who was able to take over the responsibility. Yang set up an autocratic government virtually independent of the national government. This regime lasted until 1928, though the road was beset by numerous abortive rebellions.[1]

The Carruthers-Miller Expedition, which spent 1910–1911 in Siberia, passed through Chinese Turkestan on its return. The last eight months of their expedition were spent in the Chuguchak and Hami, studying the orography and Natural History, complementing the work of Merzbacher. From Hami they returned to Guchen, Bogdo-Ola Mountains, Manass, Barlik, and back to Kuldja. They made an extensive collection and took it along through Kashgar and into India.[2]

Several years earlier, 1908–1909, the Blackstone Expedition, led by Bertold Laufer of the Field Museum in Chicago, travelled through Central China, along the borders of Tibet, and the eastern edge of Sin-kiang to study and collect *objets d'art* and craftwork.[3] The leader was highly qualified for the task and later published excellent works on the results of his studies. Subsequently the National Museum in Washington sent a similar expedition under the leadership of another

[1] Ikbal Ali Shah, "The Crescent in Chinese Turkestan"; Wei, *China and Soviet Russia*, 124–126.
[2] *GJ*, 38 (1911), 395–396.
[3] *Nature*, 91 (May 1, 1913), 226–227.

European-trained scientist, Aleš Hrdlička. Primarily the purpose was to obtain specimens for display at the Panama-California Exposition at San Diego. His goal was the upper Yenesei, Irkutsk, Mongolia, and East Turkestan; but in fact he confined his travel to the first three.[4]

During this period two other operations deserve mention, although they also only touched the fringes of the area studied here. Dr. F. B. Workman and his wife in 1911–1912 surveyed and mapped the glaciers in the Karakoram region.[5]

In 1912 a group of Italian scientists under the leadership of Dr. F. de Filippi and with aid from the Royal Purse, organized and conducted the most elaborate and thorough expedition ever to enter Chinese Turkestan up to that time. The results of the sixteen-month expedition were still being produced in print twenty years later.

The expedition collected scientific apparatus at Genoa, and on July 23, 1912 sailed for Bombay. Besides Dr. de Filippi the expedition included Commander A. Alessio, Lecturer in Theoretical Geodesy, University of Padua; G. Abetti, Lecturer in Astrophysics, University of Rome; O. Marinelli, Professor of Geography, University of Florence; G. Dainelli, Lecturer in Geology and Astronomy, Geological Institute, Florence; A. Amerio, Professor of Physics, Technical Institute of Padua; Marchese N. Venturi Ginori, Photographer; Lieutenant C. Antilli, Military Photographic Department; J. A. Spranger, Mechanical Scientist, Trinity College; the Government of India also promised to furnish an officer of the India Trigonometrical Survey to aid the expedition. Joseph Petigax, an Alpine Guide from Courmayeur, also accompanied the group.

When they reached India, August 22, 1912, they went to Kashmir and established liaison with British authorities. They took numerous pendulum and magnetic readings as they travelled north past the Zoji-La Pass. At Skardu they set up a headquarters, made many geological sidetrips, began sending pilot balloons aloft, and set up a wireless station. They made Skardu into a gravimetric station, then moved on to Leh and the Rupshu Plains.

Then continuing over the Karakoram Pass, the expedition went on into the area of the Yarkand River and tried to receive wireless signals from Lahore and other stations, with varying success. In the meantime a part of the expedition made small forays from the main path and

[4] *PM*, 58 (1912 II), 92.
[5] Workman, *Two Summers in the Ice-Wilds of Eastern Karakorum; The Exploration of 1900 Square Miles of Mountain and Glacier.*

gathered elaborate data. September, 1914 they started the return, partly through Russian Turkestan and partly through India. Floods prevented the completion of their work in the Oprang River Valley, but they did set up a series of gravity stations in the basin of the Yarkand River, and another at Kashgar, then one at Tashkent to connect with Russian work. The group that went on to Tashkent returned to Italy via Russia, the Ukraine, and Romania.

Results of the expedition were a connected gravimetrical survey across North India, Central Asia, and into Russian Turkestan, where it connected with the survey in Russia, based on Genoa. They had set up fourteen observation stations, and they had surveyed much of Eastern Karakoram and West Chinese Turkestan not previously covered. They received wireless signals all along their path; mountains did not interfere. They had a large fossil collection and voluminous geological field notes.[6]

Captain L. V. S. Blacker of the Queen's Very Own Corps of Guides, on a government mission, closely followed the latter part of the de Filippi expedition. Because de Filippi had hired so many men and animals, it was difficult for Captain Blacker to find mules or men, and all equipment had to be purchased.

July 6, 1914 Blacker set out from Leh, moved up the Indus Valley to Chang-La, to Suget Davan, Shahidullah on the Karakash and Yarkand. There he met Mr. Cotton, I.C.S., and several Swedish missionaries. He then proceeded to Kashgar, where he heard for the first time of the outbreak of the war. After some delay he continued with the Russian post to Orenburg, and thence presumably to England.[7]

Nineteen-thirteen marked the beginning of the third and longest of Stein's expeditions to Central Asia. He had remained in England after his second trip in order to help the aides in the British Museum put order into the collection and to write his full study, *Serindia.* By the end of 1911 the work was done, and he turned to work on another expedition of the same sort. In 1912 he submitted to the Indian government a proposal for a third journey. The Indian Government furnished 3,000 pounds with the exclusive right to the finds brought back for the new museum of Indian Art and Ethnography. Again the

[6] *GJ*, 40 (1912), 559–560; *GJ*, 42 (1913), 53–54; *GJ*, 43 (1914), 32–34, 672–676; *GJ*, 44 (1914), 528–534 (Letter from Filippi, Suget Karaul, August 13, 1914); *GJ*, 45 (1914), 77–78, 228–232 (Filippi, letter, Rome, December 15, 1914); *GJ*, 59 (1922), 219; *Nature*, 95 (May 20, 1914), 331; *Scientific American Supplement* No. 2056, 79 (May 29, 1915), 342, reprinted from *London Daily Telegraph.*

[7] Blacker, "From India to Russia in 1914."

Indian Government furnished two surveyors, Lal Singh and Muhammed Yakub Khan and the necessary instruments.

July 23, 1913 Stein with his party moved to Srinagar to prepare for the trip. There he also picked up three other Indian assistants. July 31 he started out, intending to follow a new route. He headed northwest to the gorges of the Kishanganga and the Indus, hoping to retrace the old tribute route by which in the T'ang Dynasty the Kashmir princes sent tribute to China. They went down the Hodur River on rafts and proceeded north from there along the Khanbari River, Shardi Pass, Tangir River, Jaglat, Yasen Valley, and Darkot Pass, Hunza, and down into the Taghdumbash Valley to Tashkurgan and into Chinese Turkestan again.

From Tashkurgan he continued to Kashgar, stopping along the way to identify places mentioned by Hsüan-Tsang. Then he divided his party into three parts, sent the baggage to Kashgar, sent Lal Singh east to survey more of the Kun Lun, and Stein went north with the second surveyor, across Merki Pass and down the Karatash River.

In September he returned to Kashgar for further preparations for his journey. There, too, Resident Macartney warned him that as a result of the revolution in China there was not as much respect for learning and scholarship as before, and that he could not always count on friendly officials.

October 9 he left Kashgar. He went first northeast to Maralbashi and found evidence of small sites scattered along what had been the old caravan route to Kashgar, Tien Shan Nan Lu. From Maralbashi he wanted to follow and survey the Mazar-tagh hills which run out into the Takla Makan. October 25 he left Maralbashi to pass over the ground Hedin found in 1896 and which Stein found to be the worst terrain in the whole of Turkestan. After four days the camels were exhausted from climbing in and out of gravel beds, and Stein decided to turn back north. In this area, far from the usual Buddhist stupas, Stein found the only archaeological remains to be neolithic arrowheads. He then pushed west to the Khotan River and followed it upstream to Khotan. There he did more digging in old grounds and found more Buddhist remains.

From Khotan Stein's expedition moved east to the Niya site again, and they arrived December 9. For the third time it yielded up to him interesting household implements, wooden tablets, and furniture. In one room they had overlooked before, they found an archive of Kharoṣṭhi records.

From Niya Stein went on to Endere and Cherchen, which he left on New Year's Day, 1914 and on January 8, he reached Charklik. Here he had difficulty raising enough laborers to help him – they were afraid of roving bands of bandits and rebels in the area. The robbers had evidently been encouraged by the weakness of the new Chinese Government. While there Stein also found two ruined buildings, where he dug up manuscripts and silk fragments. January 15 he left for Miran, the spot where Ram Singh had gone blind on the second expedition.

At Miran Stein received a letter from Macartney to the effect that the provisional government at Urumchi had issued an edict ordering survey work stopped, nor was any Chinese to help Stein. Fortunately the order was not relayed from Charklik, and his party went on with its task. Stein found later that the delay in sending the order was caused by two assassinations and a rebellion in Charklik.

In January Stein packed up and moved to the Kuruk Daria to search for the Chinese route that once had led east from Lou-Lan to China.

February 5 they reached an old fort that had been seen by a guide in 1910. When they excavated, they found 4th-century remains. Later they found another fort, with traces of Chinese, Sogdian, and Kharoṣṭhi documents. February 10 he reached the stupa site at Lou-Lan and found another batch of documents in Chinese, Kharoṣṭhi, and another script then unknown. In this area also he found an ancient burial ground with grave pits and bones as well as personal items and Chinese records, evidently from the close of the 2nd Century B.C.

Only a few days could be spent at this site because the men and animals were soon exhausted, and Stein continued to Altmish-bulak to give them a rest. Then he set out to follow the trail to the Tun-hwang caravan trail over what the Chinese called the "Desert of the White Dragon Mounds," one of the driest areas of Turkestan. Its desolation was proved in one place by the discovery of a trail of 200 Chinese coins lying on the desert floor apparently as they had dropped from a hole in some ancient traveller's sack. In ten days they reached the Tun-Hwang caravan road.

From Lake Kara-nor to Tun-Hwang Stein examined the old forts of the ruined wall. He reached Tun-hwang in March, 1914. Inquiring about the temple where he had once found a heap of manuscripts, he learned that soon after he left, Paul Pelliot had arrived and taken away many other manuscripts, but this time attracting the attention of the Chinese government, who then ordered the whole remaining library moved to Pe-king. This order had been only partially obeyed, and

many of the documents later turned up in local bazaars. Moreover, the same priest still retained a good number of the manuscripts and again shared them with Stein for a consideration.

From Tun-hwang to An-si Stein again traced the line of the ancient wall for 250 miles. A great deal of material of archaeological interest was found, particularly Chinese documents. He followed this wall to Et-sing-gol, where Russian explorers had reported ruins; and finally he reached Khara-Khoto, which Stein decided was the city which Marco Polo had called Etzina. Kozlov had found a large store of Buddhist texts there.

In June Stein reached Kan-chow, where the expedition rested. By then the British embassy had intervened with Pe-king and had a promise of co-operation from the Chinese Government. Here also Stein visited the cave temples of Ma-ti-ssu.

On leaving Kan-chow, Stein had an accident when his horse suddenly reared and fell backward on him, injuring his left thigh. He was in bed and on crutches for two weeks.

In September they set out to cross the desert by the Pei Shan Range; they passed the Well of Ming Shui, the Karlik Tagh, and finally they reached the Dzungarian slopes. In October they arrived at Barkul and Guchen. From Guchen they went out to examine ruins at Jimasa, which seemed connected with Turfan. In November they were at Kara-Khoja and decided to spend the winter about Turfan. Although the area had been well picked over by Russian, German, Japanese, and French parties, it had not been well surveyed, and the expedition then set about that work.

For the next three months Stein dug in and about Idikut Shahri and Kara-Khoja. He bought a number of manuscripts in the open market. Since the time of Le Coq and Grünwedel local entrepreneurs had extended the digging and had found and put up for sale a number of valuable manuscripts. Stein bought some of them. Then he turned to the gorge of Toyuk, with its rock caves, and then Murtuk.

February, 1915 the expedition sent fifty camel loads of antiques to Kashgar, while Stein and the rest of the crew went on to Yar-khoto, which the remains identified as the center of Turfan's population during Han times. The survey then completed a six-sheet map of the Turfan Depression. After a few days again Chinese officialdom began to obstruct Stein's work, and he decided to move on out of their reach.

February 16 he left for the Kuruk Tagh, where the party mapped the Yardang-bulak and Lou-Lan area. They then moved west to Ying

P'an and examined ruins reported by Hedin and Kozlov. They found mixed Kharoṣṭhi tablets and Chinese coins. They then went on to Korla and followed a line of watch stations for 100 miles along the foot of the Kuruk Tagh.

April 6 Stein set out for Kashgar but stopped for three weeks at Kucha, continued to Aksu, and on to Kashgar May 31, 1915. There Sir Percy Sykes, had temporarily replaced Macartney, but Stein was able to repack his collection of antiques, 182 heavy cases, and asked permission to enter Russian Turkestan and the Pamirs. July 6, 1915 he set out from Kashgar via the Ulugh-Art Pass into the Pamirs. In five days he passed the Chinese Pamirs. He went up the Bartang River into the Ali-Chur Pamir and the Langar Pass, Bash-gumbaz, and on into the mountains. Even in the precipitous mountain slopes he found evidence of old watchtowers and garrisons. He then went on to Roshan and the Kizil-su; finally, October 22, he reached Samarkand. Thence he continued south by Ashkabad, Meshed, Dalbandin, and the railroad at Quetta.

At Srinagar the 182 cases of antiquities were waiting; and they were turned over to the Director of the Technical Institute and Industrial Arts School of Kashmir.[8] Stein then began work on the scientific report of his work[9] and to make plans for still a fourth expedition.

Stein was fortunate in being able to complete his work in the war years. The German geologist Machatschek was ready to start another expedition into the Turkestan, but the beginning of the war made travel impossible, and the trip was called off.[10]

In 1915 Reginald Farrer, a companion named Purdom, and three Chinese helpers set out from Pe-king to study flowering plants. They spent the winter in South Kan-su and then moved north to Si-ning. They made an extensive collection.[11]

[8] Stein, "A Third Journey of Exploration in Central Asia, 1913–1916"; *GJ*, 42 (1913), 396, 490–491; "Sir Aurel Stein's New Expedition in Central Asia," in *GJ*, 42 (1913), 540–545; *GJ*, 43 (1914), 440–441; *GJ*, 44 (1914), 69–75 (letter, Camp Ch'ien-fu-dung, April 7, 1914); *GJ*, 44 (1914), 4; *GJ*, 45 (1915), 405–411 (letter, Turfan, November 22, 1914); *GJ*, 46 (1915), 477, 369–376 (letter, Camp Bostan Arche, July 10, 1915); *Nature*, 92 (September 25, 1913), 105; *Nature*, 93 (July 2, 1914), 460; *Nature*, 95 (April 14, 1915), 181; *Nature*, 96 (October 28, 1915), 235, (December 16, 1919), 434; *Nature*, 97 (June 1, 1916), 284–285.

[9] Stein, *Innermost Asia*; *GJ*, 47 (1916), 313, 358–364 (letter, Dalbandin, February 17, 1916); *GJ*, 48 (1916), 97–130, 193–229; *GJ*, 49 (1917), 404; *GJ*, 50 (1917), 2, 50; Kissell, "The Earliest Known Figured Silks."

[10] Machatchek, "Untersuchungen in Tien Schan," in *PM*, 60 (1914 II), 289.

[11] Reginald Farrer, *On the Eaves of the World*.

In 1914 also Colonel Kozlov was preparing his sixth expedition into Central Asia. The plan was to leave Kiachta the end of July, 1914, go through Mongolia to Khara-Khoto, a Tangut city he had found on his last trip; then they were to go on east to Koko-nor via the Tsaidam in order to turn toward the Chinese provinces of Kan-su and Sze-chuan. He hoped to map some of the areas he missed the last time and to answer some geological questions raised by his report. The Emperor had set up 50,000 rubles to help the expedition, and the Imperial Geographical Society of St. Petersburg was sponsoring it. The staff consisted of some old travellers, a geographer, a botanist, an ethnographer, an orientalist, and a Buriat officer in the Trans-Baikal Cossacks to be interpreter. Nine Cossacks and eight soldiers from the Grenadier Regiment were to furnish the military covering. The beginning of the war caused the plan's indefinite postponement.[12]

After the 1917 Revolution the old treaty of commerce and diplomatic exchange between China and Russia seems to have died a natural death. Local Chinese authorities suppressed the Russian military posts on the Pamir frontiers and caused the Russian consulates to withdraw. At the same time, to prevent the spread of Bolshevik revolutionary ideas, the Governor of Sin-kiang closed the Russian frontier. As Russian influence dwindled, English influence grew in proportion.[13] Closing the frontier to trade cut off the easiest routes of communication and left only two outlets: the long road east to the Chinese coast and the difficult road over the mountain passes to India.

In the fall of 1917 one of the largest concentrations of Prisoners of War, about 180,000, was confined in the area about Tashkent; but the revolutionary sentiment was strong in the area, and in October Soviet bands seized control of the city and opened the gates in the barbed wire, allowing the prisoners to scatter. At the same time, in their confusion they discontinued the ration previously furnished, and the German, Austrian, and Magyar ex-prisoners were left in severe straits. In the ensuing winter some 90,000 of them are believed to have died. Some joined the new Army in self-defense; others fled to Afghanistan, where they were a continual threat to British India, and others tried to live with the local Kirghiz and Sarts.

The danger to British interests was obvious, and among several other measures taken, a military mission set out for Kashgar to assist Sir George Macartney. It consisted of three British officers and sixteen

[12] *PM*, 60 (1914 II).

[13] Rabot, "Un voyage en Asie centrale."

soldiers of the Corps of Guides – the same corps, incidentally, that had furnished an escort for the Forsyth Mission 45 years before, in 1873. One of the British officers was Captain Blacker, who had been in the region three years before.

This mission proceeded up the now well-known route via Srinagar by lorry, then via Tashkurgan to Yarkand and Kashgar. At Tashkurgan they established contact with the regiment of Orenburg Cossacks, Tsarist loyalists, and co-operated with them.

Once in Kashgar the mission placed itself under the command of Macartney. At that time a five-sided conflict was being waged by different interests in Russian Turkestan. The British mission proceeded by the Terek Davan to Tashkent for a purpose best known to Macartney, and all started back in September, avoiding the regular road to Kashgar, which was in hostile hands. When they returned to Tashkurgan, news reached them that a band of 200 Germans, Turks, and Afghans had crossed the Pamirs and were heading for Yarkand. This news set off a seven-week manhunt. The English knew well that in 1917 a German agent, von Hentig, had crossed through Badakshan into the area and had operated there; so it was very possible for a group to operate in the northern reaches of India or in China.

Keeping the trail mostly by interrogating local natives, the British mission went up the Tashkurgan and Oprang Rivers, crossed to Kulan Aghil, the Chup River, Ak Masjid, and Kokyar. At Bulun they ascertained that they were only two days behind the party; and at Chini Bagh, one mile outside Yarkand they made a pre-dawn attack and surprised the group they had trailed. To their disappointment the Europeans were all Austrians, no Germans.[14]

The mission marched on to Kashgar and turned the prisoners over to Chinese authorities and in November, 1918 started back to India.

In 1920 a Polish scientist, F. Ossendowski, was living in Krasnoyarsk when he heard of his impending arrest by the Bolshiviki. He fled to the forests and attempted to reach China or India. This trail led him first to the Yenisei forests and Mongolia. In Mongolia Chinese collaboration with the Soviets closed the door of escape, and Ossendowski with some other White Guardists, commonly called White Russians or Czarists, tried to go past the Gobi and the Tsaidam and Tibet to India. Hostility in Tibet caused the group to move back across the Tsaidam to Urga, where General von Ungern-Sternberg helped them reach

[14] L. V. S. Blacker, "Travels in Turkestan 1918–20"; *idem, On Secret Patrol in High Asia*; F. M. Bailey, *Mission to Tashkent*.

Manchuria. This group, then, saw much of eastern Chinese Turkestan, but preoccupied with survival as they were, they could add little to geographical knowledge.[15]

The experience of Ossendowski parallels that of a host of Russians whose story remains to be told elsewhere and whose names have almost entirely escaped this study. With the spread of Bolshevist military operations, Czarist military units and families moved east toward Vladivostok under very trying circumstances. In relatively large numbers survivors of the harsh trials succeeded in crossing the Chinese borders and tried to carve out new lives for themselves in their new country.[16] Hundreds reached Sinkiang and settled in Urumchi and Kashgar. Since they represented a uniformly cultured and educated class, they gradually came to form a middle class of small entrepreneurs, mostly doing clerical or professional work. Some 10,000 military under Ataman Dutov, Ataman Annenkov, and General Bakich, entered Sin-kiang but were disarmed and interned as required by international law. Smaller groups of civilians and soldiers moved about China for years, only gradually finding places for themselves in the Chinese economy, and then mostly in the large cities, by emigrating, and by returning to the Soviet Union. Some failed to make the necessary adjustments. One group reached Tun-hwang, where the Caves of the Thousand Buddhas had been abandoned by the priests in whose care they had been entrusted. The refugees camped in the caves, and their campfires badly blackened some of the magnificent wall paintings not carted off to European museums.[17]

Unfortunately these refugees rarely had occasion for scientific work, and their travels and observations have only sporadically reached print.

One of the scientists who chose to stay but not to co-operate with the new regime was the eminent geologist Paul S. Nazaroff. Imprisoned in Tashkent, he escaped and hid in nearby mountains for a while and

[15] Ossendowski, *Beasts, Men, and Gods*.

[16] For efforts of the Red Army to intercept them, see *Diplomaticheskii slovar'*, I, 671 ff., quoted in Whiting, *Soviet Policies in China*, 309. While names are rare in published literature, two of Annenkov's soldiers, friends named Smigonov and Makeyev, escaped to China and became traders in Sin-kiang. For their story see Haslund, *Men and Gods in Mongolia*, 184–185.

From this point on the writer regrets to say that the reader must be ever on the alert for political coloring of the source material used in this study. I have proposed to avoid political involvement and stick to a record of travel and development of geographical knowledge. While I have tried to push back to primary sources for factual information, that search has also forced me to utilize partisan writing.

[17] Vincent, *The Sacred Oasis*, 36.

gradually worked his way during a two-year period across the border to Kashgar. He spent four years there, studying the mineral resources.[18]

In 1922 the position of British Consul General at Kashgar had been left open, and C. P. Skrine was appointed to the post. In preparing for the journey from Srinagar, he went by Delhi and asked Sir Aurel Stein for advice. Stein suggested that a useful contribution to geography could be made by utilizing the route down the Karatash River, studying the Qungur Massif, particularly the eastern face, which no one had yet seen. Skrine then obtained some surveying instruments, although he had very little instruction in their use. He left Srinagar June 3, 1922. From the beginning it was clear that the animals could not cross Merki Pass; and Skrine gave up the idea and went on to Kashgar by way of the Tari-Art and Kashka-su Passes, Tashkurgan, Yangi-Hissar, and on to his destination, which he reached July 18.

On October 11 Skrine left Kashgar for a tour of consular duty at Yarkand, Khotan, and Keriya. Instead of going straight to Yarkand, however, he turned off the main road at Yapchan and Akhtur Bazaar on the banks of the Karatash River. Here the group, including Skrine's wife, went up the river, accompanied by Geologist Paul Nazaroff from the small colony of Russians at Kashgar. On October 14 they set out to ascend the river valley. They found several cantilever bridges built by the Kirghiz, but at last they had to begin fording the streams when they had to cross. They found evidence of small farming operations and orchards far up the river. When they reached the narrow gorge Chimghan Jilgha, it seemed there was no chance of their getting through. Instead, they tried climbing one of the side valleys. There they managed to reach the top of Kaying Beli, 12,750 feet high, and from there used Skrine's plane table and clinometer to map out the valley und surrounding peaks. He also took many photographs, which he developed later in a camp and which helped greatly in recognizing the mountains from other angles.

With great difficulty Skrine and his guides returned to the river valley, only then to find that during their absence his wife and Engineer Nazaroff had discovered a passable route around the gorge. In two days they reached a full view of the peaks later called Shiwakte I and II. They were surprised to find quite a forest of juniper and fir in the area, some firs as much as 100 feet high. The next day he managed to photograph the eastern face of Qungur for the first time.

[18] Nazaroff, "The Soviets and the Minerals of Eastern Turkistan"; *idem*, *Hunted through Central Asia.*

The return journey was much shorter, but then Skrine decided to reconnoiter the Achiq Jilgha. After some success in this endeavor, he continued to Yarkand.

The next year, April, 1923, Skrine was again in the Yarkand area, and he set out to see more of the rugged foothills of the Kun-lun. The Swedish missionary Nyström in Yarkand had told him of seeing fir trees near Ai-Bulung, which matched his own experience, but no other traveller seems to have reported conifers in the area. The group again followed the Karatash down to its mouth.

Again in June Skrine returned for a long vacation and camped for three weeks in the Karatash, doing amateur botanical and geological work and taking photographs of the mountaintops. In particular he noted abundant evidence of copper in the mountainsides. This trip ended at Little Karakol, September 15, when he went on to India and turned his cartographic materials over to the officer in charge of the cartography of the Pamir region.[19] For his work in this expedition and his official duties, in 1927 Skrine was awarded the Gill Memorial by the Royal Geographical Society.[20]

On the political scene in the meantime some positions had shifted. China had not recognized the new government in Russia, and Governor Yang had avoided contact. However, in 1920 the border could not be ignored. After two conferences Yang signed a trade agreement on May 27, 1920. It provided for renewed trade and for the repatriation of the refugees.[21]

Meanwhile in 1925 a revolt started up in Mongolia. Kobdo was occupied by Mongol forces, and both Kobdo and part of the Altai passed out of Chinese occupation as the Mongols succeeded in setting up a separate government outside the old Chinese Empire boundaries.[22]

In 1923 Colonel P. Kozlov, who had survived the troubled years of the revolution, revived his plan for an expedition to the Nan Shan, the

[19] Skrine, "The Alps of Qunqur"; for the story of Nazaroff, see *Hunted through Central Asia.*

[20] *GJ*, 71 (1928), 608.

[21] Lattimore, *Pivot of Asia*, 62.

[22] Tien-Fong Cheng, *A History of Sino-Russian Relations*, 100–101; Etherton, "Chinese Turkestan." A similar plan for Sin-kiang was evidently under study because the manifesto of the Second National Congress of the CCP (July, 1922) lists among its objectives the following: "(H) The achievement of a genuine democratic republic by the liberation of Mongolia, Tibet, and Sin-kiang" – Conrad Brandt, Benjamin Schwartz, and John K. Fairbank, *A Documentary History of Chinese Communism* (Cambridge (Harvard University Press), 1957), p. 64.

Tsaidam, and Tibet. It was essentially the same plan that he had presented in 1914 but which had fallen through at that time. With the help of the Russian Geographical Society he proposed a three-year expedition with twenty-one members to visit these places and study the sources of the Yang-tze and other rivers as well as the geology, botany, zoology, and ethnography of the area. The first excavations were in Mongolia, but in 1925 part of the expedition continued to Khara Khoto. On their way across the Gobi they found a number of prehistoric vertebrate fossils.[23]

Since 1920 there had been very little trade and still less travel across the Russian border. In 1925, however, after the establishment of a coalition government in Nan-king, which included several friends of the communists, restrictions relaxed. That same year the Russians returned to Turkestan with a commercial mission that set up in Kashgar. It included activities of a political nature to which the government was then more lenient.[24]

In 1925 two prominent Americans entered the Turkestan. Theodore Roosvelt Jr. and his brother Kermit left New York after the former had suffered defeat in the New York governor's election. The immediate reason was the interest of the Field Museum of Natural History in Chicago in obtaining specimens of some of the rare animals of the area, especially the *Ovis poli* and the wapiti. The Museum and James Simpson furnished the necessary funds. In keeping with the tradition for such sportsmen, they took along a bona-fide scientist, George K. Cherrie, who already had some 38 expeditions behind him, and a photographer, Suydam Cutting. The small expedition sailed to India, went by train and automobile to Srinagar, and started the expedition proper from there. They followed the corridor north through the Pamirs to Kashgar and then the Tien Shan Mountains. There the hunting expedition found most of the specimens it sought. The party met relatively few political

[23] *GJ*, 62 (1923), 152–153; *PM*, 58 (1911 II), 26; *PM*, 61 (1914 II), 26; *PM*, 70 (1923), 181; *GJ*, 68 (1926), 170; *GJ*, 69 (1927), 262; *Novi vostok* [All-Russian Association of Oriental Studies], 15 (1923?), No. 10, 11;* *GR*, 16 (1926), 616–618*; Obituary in *GJ*, 87 (1936), 190–191. "In 1923 with the assistance of the Soviet Government, he published a fully illustrated account of his exploration and of Khara Khoto." – *Nature*, 136 (November 2, 1936), 710.

[24] C. Rabot, "Un voyage en Asie centrale." A lamentable development of this study from this point on is the necessity of referring to Soviet citizens in Chinese Turkestan in collective terms and groupings. The absence of individual names is all the more regrettable here since some of the Russians were men of scientific training and indeed "experts" who should be given credit for their contributions. After all, people do things; organizations do not. Organizational anonymity is mostly a means of avoiding responsibility.

setbacks, and after five and a half months they returned to the Pamirs, to India, and to the United States. The general account of the trip was based on diary entries made during the travel.[25]

Another German expedition, that of G. and M. Popov in the Chimgan Valley of Western Tien Shan in 1926 studied the flora of the valley. In particular they reported on the distribution of the wild apple tree, *Birus Malus L.* and wild apples which were almost identical with cultivated ones, such as the Astrakhan apple. On this basis they decided that the different kinds of cultivated plants not only can be formed by man's influence but also by nature's.[26]

Far from being out of the picture, Sven Hedin and Swedish geologist E. Norin in 1926 accepted an offer to aid the Chinese Geological Survey, which planned studies in Kan-su, Western Mongolia, and Chinese Turkestan, specifically for the purpose of topographical, geological, climatological, and archaeological work.[27] The program gradually expanded into a much more extensive expedition that did not get under way for another two years.

In January, 1926 Dr. Wilhelm Filchner set out from Tashkent with the purpose of establishing a chain of magnetic stations of observation between Tashkent observatory and Koko-Nor, and setting up a parallel line from Koko-Nor to Kashgar. He did not complete the project and at the end, instead of returning through Russia, he went south into India, where he checked his data with the Survey of India.

The journey started from Tashkent. Filchner entered Sin-kiang at Kuldja and continued across the Gobi to Sub-si and Kum-bun, near Koko-Nor. By then Filchner had exhausted his funds and provisions; so he decided to abandon his mission and join two other European travellers whom he met there on their way to Shigatse. The three men then obtained a pass from General Ma and in May, 1927 left Koko-nor. They reached Nakchuka, near Lhasa on September 10, 1927, but they were turned away from the capital and had to continue to Leh, which they reached in February, 1928.[28]

In 1926 the Morden-Clark Expedition, led by Willam J. Morden, set out on a hunting expedition to look for the *Ovis Poli,* which had become rare in Chinese Turkestan. James L. Clark of the American Museum of Natural History accompanied him. They left New York

[25] *Literary Digest*, 85 (April 4, 1925), 56–63; Roosvelt, *East of the Sun and West of the Moon.*

[26] *PM*, 73 (1926), 177.

[27] *PM*, 74 (1927), 166.

[28] *GJ*, 74 (1929), 597–598.

January, 1926, passed through Bombay, and then went by rail to Rawalpindi, thence by motor car to Srinagar. They had to start before the regular opening of the passes because the specimens they were seeking would lose their winter coat early and would be useless for mounting. They obtained permission to enter Russian territory and set out via Gilgit, Burzil Pass, and to the headwaters of the Ak-su River. Here they obtained several specimens. They then went down the river to Kashgar, then up through the Tien Shan to the Tekes Valley and Yulduz Plateau in search of the wild sheep. The return route was via Siberia, which they reached by the road from Urumchi across the Dzungarian steppes to Kobdo. They had suffered mistreatment and violence from local authorities but achieved most of the aims of the expedition.[29]

The Trinkler Expedition of 1927 marked a more formal return of German scientists to the Turkestan than the efforts of Filchner. Dr. Emil Trinkler with Geologist Dr. de Terra and a Botanist, W. Bosshard, set out from Leh July 12, 1927, passed Suget Karal in October, and intended to go on via Lake Lighten and then to Polu; but the loss of many of their animals caused them to turn northwest to the Karakash Valley. All along the way from Leh they re-surveyed the route, and de Terra made a geological survey, watching particularly for signs of the last glaciation period.

After leaving Suget Qaraul, Trinkler spent five months studying the geological history of West and Southwest Takla Makan, while de Terra studied the geology of the Kun Lun south of Yarkand. In July, 1928 the group left Yarkand, and they returned via the Karakoram to Leh. Trinkler thought he had found proof of a great lake in the Tarim Basin after the Ice Age, and that parts of it lasted as late as the 4th or 5th centuries A.D.[30]

Soon after his return to Germany, and at the early age of 35, Trinkler was killed in an automobile accident.[31] His geological observations were not ready for publication at the time of his death; they were brought out by Ilse Trinkler and G. Köhler, with contributions also by Dr. H. de Terra.

Walter Bosshard, who was on the Trinkler Expedition as it moved through India and to Kashgar, left the expedition at that latter point

[29] *GJ*, 73 (1929), 285–286; J. L. Clark, "New Horizons in Central Asia," in *Natural History*, 54 (May, 1945), 120–135; *idem*, "Chinese Turkestan"; *idem*, "The Illik of the Thian Shan."
[30] Trinkler, "Explorations in the Eastern Karakoram and the Western Kun Lun."
[31] *GJ*, 78 (1931), 95.

and continued to Germany via Tashkent and Moscow. Before leaving Trinkler, however, he made a side trip to examine the ruins of Rawak and Dandan Ulik, several times visited by Stein. Also from Kashgar he travelled through the Bostan Terek and recorded useful information from that region.[32]

Owen Lattimore, prosecuting his studies of China, in 1926 planned a journey for the study of Western China and the Turkestan. Since he married shortly before his departure, it seemed adviseable to send his wife on ahead by rail to meet him at Chugachak. Mrs. Lattimore left the train at Semipalatinsk and proceeded by tarantass to Chuguchak. Her husband, in the meantime, accompanied a caravan from Kweihua to Kucheng-Tze along what he called the Winding Road via Etsina, the House of the False Lama, Dead Mongol Pass, and Tuhulu. He was possibly the first European to follow the full length of the road.[33] The two then crossed the Tien Shan together, visited Kuldja, and went around west of the Takla Makan to Yarkand and south into India. The other principal cities that they visited were Ak-su, and Kashgar.[34] In Kashgar they enjoyed the hospitality if not the company of Major Gillan, the British Consul at the time, and the Chinese Secretary Chu, who had come from India via the Karakoram in the British Service. He found the Swedish missionaries still active, though he gives us no names. He then continued to Yarkand where he met a vice-consul on his way to his post, and several British officers hunting or sight-seeing. From Yarkand they took one month to reach Leh, over the Five Passes.[35] Thereafter Mr. Lattimore wrote extensively about both east and west China.

Continuing the very active year of 1927, Lieutenant Colonel R. C. F. Schomberg of the British Army travelled extensively in the Tien Shan area, 1927–1929 and again 1930–1931, details of which he published.[36] During his travels he made a careful study of the geography, especially the economic geography of the area and thereafter not only wrote widely on the subject but became popular as a reviewer of books on Central Asia.[37]

In the summer of 1927 Lieutenant Colonel G. K. Gregson and his

[32] *GJ*, 77 (1931), 270–271.
[33] Lattimore, "Caravans of the Winding Road."
[34] Lattimore, "The Desert Road to Turkestan"; *idem*, "High Tartary; from the Siberian Border to India"; *idem*, "Into the Heavenly Mountains."
[35] Lattimore, "The Desert Road to Turkestan."
[36] Schomberg, *Peaks and Plains of Central Asia.*
[37] *GJ*, 85 (1935), 87; Schomberg, "The Oasis of Kel-pin".

wife travelled from Srinagar to Yarkand. Other members of their party were Mohammed Ratta, Ibrahim an Argun, and Ghulam Hussan. Leaving west of the Karakoram Pass, they went northwest to an area called the Amphitheatre. July 14, 1927 they camped at Chajos Tilga. Along the way they made an incidental collection of small animals and insects. July 19 they reached the Lungmo Che Junction. They passed Khuffelang, July 23. While they did not follow the regular trade route, they found good grazing ground for their animals.[38]

In 1928 Yang Tseng Hsin, the strong man of Sin-kiang, died or was perhaps murdered. The National Government appointed as successor General Chin Shu-jen (Chun Shu-san). It already seemed impossible to prevent the penetration of Soviet influence into Sin-kiang, but neither the governor nor the Kuomintang seemed to realize the gravity of the problem. The new governor not only persecuted the Moslem population, but in Hami his taxation policy forced the Moslems to an open revolt that spread to Ak-su, Urumchi, and Kashgar. In Kashgar Janib Beg, despite defeat and imprisonment kept the rebellion alive in the Khotan-Yarkand area.[39]

In 1930 the Turkestan-Siberian Railway was virtually complete. Much of it hugged the Chinese boundary along western Sin-kiang. At the same time Urumchi became accessible to the west by the opening of a motor road to Chuguchak, thence to the railhead at Sergiopol, and another road started from Sergiopol toward Kuldja. Commercial transportation to and from Sin-kiang naturally began to orient itself toward Russian Turkestan. British interests had not made enough use of their opportunities in the intervening years to offset these geographical advantages.

To add further to this weakening of established rule, in 1931, when the National Government tried to assert its strength in the Hami district, open rebellion broke out. The Chinese then enlisted 1,800 Russian political exiles, or White Guardists, in their forces. These mercenaries were accused of severities which made feelings even more inflamed. While these exiles come within the range of this study, their names are unfortunately lacking except for their leader, Colonel Pappengut and his aide Bukhteyev.[40] When the Hami rebels saw their

[38] Gregson, Margaret, "Note on the Headwaters of the Yarkand River."
[39] Ikbal, "The Crescent in Chinese Turkestan"; Tien-Fong Cheng, *A History of Sino-Russian Relations*, 169.
[40] Lattimore, "Where Three Empires Meet"; Li Chang, "The Soviet Grip on Sinkiang," 409.

cause doomed, they called on a Kansu Moslem General, Ma Chung-Ying, for help.

In 1933 with the collapse of Chinese opposition to Japanese military operations in Manchuria, many Chinese troops there were forced across the border into Siberia. One of the generals, Sheng Shi-Ts'ai, went over to the Soviet side with his troops. Instead of observing international law as Governor Yeng had done with the White Russian refugees, the Russians then brought the General to Sin-kiang and helped him in what amounted to an invasion of the province.[41]

In the meantime in the province not only did Japanese "agents" begin to operate toward a separatist movement,[42] but in 1931 Moslem General Ma Chung-ying or "Big Horse" began to challenge the authority of the new Governor, Chin Shu-jen. Other Moslem forces took the field at this time, some of them not co-ordinated with Ma or not regularly. One of the leaders, Tungan Ma Shao-wu, allegedly had material support from Soviet Consul Postnikov in Kashgar.[43] The claim has been made that General Ma's troops had British weapons.[44] If so, then there must have been travellers across the Indian borders whose names I cannot find. The story may very well have been false because the Russians later supported Ma and gave him refuge when he failed.[45] Rumors also have a Turk, Kamal, from Istanbul on Ma's military staff and a couple of Japanese advisers. Germany and Japan are also credited with helping him, but none of these well wishers had the facile communication system enjoyed by the USSR.

Although General Chin made several concessions to the Soviets in an effort to save his regime, it availed him nothing,[46] and in 1934

[41] Tien-Fong Cheng, *A History of Sino-Russian Relations*, 170–171.
[42] "Durchdringungspolitik in Zentralasien."
[43] Li Chang, "The Soviet Grip on Sinkiang."
[44] Burton, "Tug of War in Central Asia," 518. One news magazine credits him with 10,000 British rifles – *Newsweek*, 6 (October 5, 1935), 14–15; Aitchen K. Wu, "Will China Save Its Far West?" If the British furnished 10,000 rifles, it was a bad bargain because in May, 1934 a Turki band of the Moslem confederacy attacked the British consulate in Kashgar and killed several members of the staff – Ikbal, "The Crescent in Chinese Turkestan." However, in this mêlée of shifting loyalties and alliances consistency was one of the first virtues to be discarded. Ma may just as easily have had support of the Nan-King Government, which feared the foreign ties of General Sheng as much as the religious ties that Ma's program entailed – Bridges, "Dynamite in Sinkiang," 44.
[45] Wu, *Turkestan Tumult*, 236–237, quoted in Lattimore, *Pivot*, 211.
[46] These concessions mainly took the form of a secret treaty on October 1, 1931. It gave the Russians rights to commercial offices in Urumchi, Kuldja (now called Ili), Chuguchak, and Kashgar, and more restricted rights in Turfan, Karashahr, Ak-su, Yarkand, and Khotan. It allowed free movement of Soviet citizens

Sheng Shi-Ts'ai gained control of most of the province. The Nan-king Government, the Kuo-min-tang, then sent its Foreign Minister, Dr. Lo Wen-Kan, to Urumchi to make peace, but he was arrested and had to ask Russian help for his release.

With only General Ma now opposing him, Sheng accepted Russian help and concluded a commercial agreement with General Pogodin in December, 1933. Early in 1934 the Soviets sent both air and ground forces to help against Ma, who withdrew to Kashgar, then, accompanied strangely enough by Secretary of the Soviet Consulate Constantinoff and "Some members of the Soviet Trade Agency", he crossed the Soviet border at Irkeshtov.[47] The Russians then set up an aid program through the government corporation Sov-sin-torg and sent a number of technical advisers in education, public health, agriculture, transportation, and industry,[48] whose names are not available. One of the signs of the Soviet strength was an order to Sheng that the Swedish missionaries who had labored so long in Kashgar must leave. They complied without significant protest.[49] May 16, 1935 a further agreement for the "reconstruction of Sin-kiang" was signed with Svanidze (Stalin's son-in-law) and the President of the Soviet Bank for Foreign Trade, who went to Sin-kiang for that purpose.[50]

The mainstay of the Moslem revolt had been two politico-religio-ethnic groups, the Kazakhs and the Dungans. The latter finally gave

and linked telegraph lines with those of the USSR – Li Chang, "The Soviet Grip on Sinkiang," 493. Russian representative Slavusky signed for the USSR, but it is not clear whether he actually entered Sin-kiang for the signing – Tien-Fong Cheng, *A History of Sino-Russian Relations*, 170.

47 Li Chang, "The Soviet Grip on Sinkiang," 494. Diplomats were not the only ones who crossed the border. Although not revealed at the time, evidently soldiers came to help him, because in 1940, when Soviet agents were pressuring Governor Sheng to sign a new treaty, they reminded him "... that ... during the rebellion of Ma Chung-Ying, much of Soviet blood was shed in Sinkiang for which Russia had not yet been compensated" – Sheng to Chiang Kai-Shek, July 7, 1942, quoted in Li Chang, "The Soviet Grip on Sinkiang," 498. Tien-Fong Cheng (*A History of Sino-Russian Relations*, 171–172) claims that the "White" mercenaries were placed under the command of Soviet officers, and that after Ma's last push toward Urumchi "two brigades of G.P.U. troops with tanks and artillery" came to Sheng's aid with success. Soviet troops also helped later to bring Khotan under control. See also Wu, *China and the Soviet Union*, 256–257; McLean, "The New Dominion," 134.

48 "The True Story of Sinkiang"; Conolly, "The Industrialization of Asia," Part V, "Sinkiang."

49 McLean, "The New Dominion," 135.

50 Li Chang, "The Soviet Grip on Sinkiang," 495; Alexander Barmine, *One Who Survived*, 231–232, quoted in Tien-Fong Cheng, *A History of Sino-Russian Relations*, 175.

up the struggle, but a large portion of the Kazakhs, seeing their religion and traditions jeopardized by pressure both from east and west, could not make the adjustment. After a period of support given and withdrawn from the Kuomintang, and after the execution of their leader, Osman Bator, they gradually moved south, though harassed at every step by political authorities, over a period of years. They gradually reached Tibet through the Kun-lun but met only hostility from the Tibetans and had to edge further west. In 1951, when at last they reached the Kashmir border, they did not even find a welcome from their co-religionists there. Finally with charitable aid, the small batch of survivors reached a refuge in Turkey.[51]

While the Japanese were unable to prevent the pro-Soviet takeover, they did maintain a constant threat to Sin-kiang by sponsoring work on a motor road across Inner Mongolia from Sui-Yuan to Sin-kiang and an extension of the Pe-king to Sui-Yuan Railway in Sin-kiang.

Another railroad, the Lung Hai (Belgian-French owned) represented the Kuomintang's main hope of countering the Soviet facilities; and both Nan-king and the owners worked diligently at laying a track through Kan-su into Sin-kiang, but progress was too slow to be effective.[52]

As early as 1930 a German air-line had operated irregularly between Shanghai and Urumchi. The only pilot to write about his observations was Hans Koester, and he only reported flights as far west as Si-ning.[53] During the 30's the efforts of China to open direct air routes across Sin-kiang and Russian Turkestan failed. By 1939 an airline flew regularly from Pe-king to Urumchi at $1,230 per flight. The Japanese-controlled motor road via Sui-yuan was open and from Central China only took thirteen days. The most convenient route was still by rail from Vladivostok to Semipalatinsk, then by car to Urumchi. The Lung-hai railway had reached Si-an-fu.[54]

While travel facilities between India and the Turkestan remained almost unchanged, and those between Nanking and Sin-kiang made slow progress, the facilities across Mongolia improved and those via Soviet territory made rapid progress. The accessibility of the Turkestan to Western scientists remained about the same because the relatively easy transit between Osh and Western Europe was hampered by the

51 Lias, *Kazak Exodus*; *Time*, 58 (October 22, 1951), 41.

52 Burton, "Tug of War in Central Asia."

53 Koester, "Four Thousand Hours over China."

54 Wu, *China and the Soviet Union*, 260.

difficulty of obtaining transit visas through Soviet territory. It is with these conditions in mind that the expeditions of the next ten years are to be visualized.

Dr. Ph. C. Visser, who had already conducted one successful expedition to Central Asia, made another attack on the mountains in 1929–1930 for the purpose of exploring the unknown regions of the Karakoram and Saltoro-Karakoram. The expedition included Dr. Visser, Mrs. J. Visser, a botanist; J. A. Sillem, zoologist; R. Wyss, geologist; Frans Lochmatter, a mountain guide, Khan Afraz Gul Khan and Muhammed Akram, surveyors.

The group left Leh with 445 coolie-loads of supplies in May, 1929 and studied the Shelkar Chorten Glacier, Sasser Pass, the Depsang Plateau, Chip-Chap Valley, and the Aghil Mountains. By early winter they had crossed Sanju Pass into the Kun-lun. From there they passed down the river valley to Yarkand and then Kashgar, where Sillem undertook a side trip to Maralbashi. After a stay in Kashgar they returned to Yarkand, and on April 27, 1930 they left again for Khotan, which they reached in ten days. Then they began a return along the Karakash Valley. Around Suget Pass their supplies ran out, and they had to start for Yarkand to try to meet the caravan that should have met them already. They returned to the Karakoram Pass and into India with a great store of geographical and geological data.[55]

By 1931 a new element had crept into desert travel. With the advance of the automobile in outlying areas it became possible to cover areas which earlier could be crossed only with great toil. The leaders of this first expedition were Georges-Marie Haardt and Louis Audoin-Dubreuil, who already had crossed North Africa by automobile. They organized this expedition in an elaborate fashion, with two divisions, one to start in Asia Minor and proceed to Pe-king, the other, led by Naval Lieutenant Victor Point, to come from Pe-king to meet them. Other members were Father Teilhard de Chardin, a geologist and paleologist; Joseph Hackin, an archaeologist and curator of the Guimet Museum; Delastre; Jourdain, a mountain specialist; Georges Le Fèvre, a historiographer; Lieutenant Pecquer of the French Navy, geodeist; Owen Maynard Williams of the National Geographic Society; Young, assistant in the Geographic Department of China; André Sauvage, motion picture operator, with two helpers, Specht and Morizet; naturalist André Reymond; Technician Brull of the Citroën automobile factory; and mechanics and drivers Maurice Penaud, Sivel, Schuller,

[55] Visser, "The Karakorum and Turkestan Expedition of 1929–1930."

La Planche, Cecilien, Normand, Chauvet, Kervizic, Kegresse, Jocard, Corset, Leroux, Muret, Piat, Conté, Dielmann, Balourdet, Bourgain, Remillier, Ferracci, Collet, Gauthier, and Gaufreteau. Dr. Tsu-Ming-Yi accompanied them as representative of the Chinese Republic.

The expedition left Beirut April 4, 1931, with six machines, while another group set out from Kalgan, going west. May 17 a Russian artist, Yakolev, joined the first group. The western group passed Baghdad and Teheran and went on to Meshed with only minor difficulties, met more difficulties from Meshed to Kabul and Srinagar. At Srinagar serious trouble began, and they left the 4-ton truck there. July 2 the group under Hackin started out in spite of floods and in four days reached Gurais, over 12,00 feet high. At Daukun Pass, 13,000 feet, they had to move some of the load to horses to get past the snow. At Astor they had terrific obstacles to overcome, but they reached Gilgit August 4.

The other part, under Haardt, only got as far as the Hunza River and had to abandon the cars – a great pity since from the other side on there was ample roadway. Although Grombechevski in 1892 had noted that a coach-and-four could drive from Gulcha to Ulugh Davan, in 1926 Sin-kiang Province was not officially credited with having any motor roads.[56]

They used animals to carry the expedition past Tashkurgan, Ulugh Rabat Pass, Tashmalik, and Kashgar. They then pushed on to Ak-su, where they met four cars from the eastern group; and all returned to Urumchi to overhaul the vehicles.

The eastern group, in the meantime, had been stopped by political disturbances among the Moslem Chantos. These rebellions had continued for years, and nearly every expedition in the area had difficulty from the insecurity of the land.

The party continued to Hami (Qomul) December 11, where they had even more difficulty staying clear of the Moslem rebels and nationalist forces. They did continue, however, to Su-chow, to Kan-chow, and Liang-chow, which they reached December 29. The expedition then continued into China. Unfortunately the very next March 15 Haardt died in Hong Kong.[57] They had not quite proved the feasibility of crossing the continent by automobile.

[56] "China," in *Annals of the American Academy of Political and Social Sciences*, 152 (1930), 163.

[57] L. V. S. Blacker, "La Croisière Jaune"; *GJ*, 84 (1934), 446–447; Williams, "The Citroën Trans-Asiatic Expedition Reaches Kashmir"; *idem*, "First over the

Three American missionary women deserve comment here, although it is difficult to tell where they belong chronologically. During the 20's and 30's of this century Evangeline French, Mildred Cable, and Francesca French were active through Chinese Turkestan and in Kan-su as part of the China Inland Mission, engaged in missionary work. Their travels criss-crossed the area under discusison in an elaborate maze. They travelled with little equipment and sometimes with little money, often following the paths of devastating armies during the bloody Moslem uprisings of the period. All three were highly literate and observant and fortunately have preserved in publication some of their experiences. Cable in particular, while travelling in the Tun-hwang area, discovered a whole new set of "Caves of the Thousand Buddhas", only a few miles from the more famous ones but which had been entirely overlooked by Stein and his followers.[58] At last, after some 30-years' work there, and after severe mistreatment by the Chinese while stationed at Urumchi, they were released and allowed to cross the frontier into Russia and return home.

In 1928 Sven Hedin returned to China. The Nationalist Government retained him on a contract to lead a surveying expedition that would investigate the feasibility of opening the ancient road south of the Takla Makan. This was intended to be Hedin's greatest expedition. Gradually gathering a party of experienced scientists, he started from Pe-king with Duke Larson, J. G. Anderson, Henning Haslund-Christensen, and plans for a party of 28 Swedes, Germans, and Chinese scholars. At the end of the Ching-chang Railroad the expedition proper started. They had been joined by a photographer Lieberenz. He and Haslund took a route north via Kalgan to gather a camel train. They then continued to Kara-Khoto (Etsina). As finally constituted, the expeditions had 18 Europeans, 10 Chinese, 34 servants, and up to 392 camels. Geologists, physicians for anthropometric measurements, archaeologists, meteorologists, navigator-radiomen, photographer, and an administrative staff made up the party. For the purpose of their survey they divided into 3 echelons to establish a triangulation net. They sent up sounding balloons daily. "Never has a more elaborate

Roof of the World"; *idem*, "From the Mediterranean to the Yellow Sea by Motor"; Haardt, "The Trans-Asiatic Expedition Starts"; Le Fèvre, "La mission automobile Centre-Asie"; *idem, An Eastern Odyssey*; "Strange Cars to Follow Marco Polo's Asiatic Route," in *Popular Science Monthly*, 119 (July, 1931), 25.

[58] Mildred Cable, "Bazaars of Tangut and the Trade Routes of Dzungaria."

and comprehensive exploring expedition penetrated the heart of Asia." [59]

Norin and Bergman were to follow along a southern route, while a middle group consisted of meteorologists Haude and Li, and astronomers Dettman, Hempel, and Kaul.

Just outside Hami they were stopped and refused entrance into Sin-kiang. Finally in January, 1928 they were conducted to Urumchi under guard. There Haslund visited the dispossessed Czarist Consul, who had chosen to remain where he had worked so long.

Finally partial permit was given for the expedition to continue its work. Haslund and Bergman went to the Lop Desert and Charklik to do their surveys. Then Haslund returned to Urumchi to outfit the rest of the expedition. On arriving he found that the old governor Yang had been murdered, and his successor Chin Shu-jen, was opposed to the expedition. Returning across the Tien Shan, he spent weeks in Öreget making anthropometric measurements among the Turguts and recording some of their music. When he returned to Urumchi this time, he found that Sven Hedin and Hummel had gone to the United States to try to elicit support for the continuance of the expedition. Amboldt and the mechanic Carlson were in the city, but most other members of the expedition had gone home. He had brought a Torgut temple to be set up in Sweden and, with a Chinese escort, carried it across the border to Russian territory and then to Sweden.[60]

Throughout this study insufficient attention has been given the work of missionaries in the Turkestan area, partly because their work rarely entered the field of geography, and indeed often did not reach print. The Roman Catholic Church in 1913 placed Sin-kiang, Mongolia and Kan-su in the missionary jurisdiction of the Scheutveld Fathers.[61] The most prominent Protestant organization was the China Inland Mission, set up in 1865 for work in the interior. By 1893 "stations had been opened in the capital cities of 11 provinces and much of the remaining portions of the empire, including parts of Manchuria, Mongolia, Sin-kiang, and Tibet had been traversed." [62] Scattered references have already been made when the literature shows them, but in the 19th

[59] *GR*, 19 (1929), 696. See also *Science*, N.S. 65 (February 11, 1927), Supplement, p. 14; Obituary in *GJ*, 119 (1953), 252–253.

[60] Haslund, *Men and Gods in Mongolia*.

[61] Latourette, *History*, VI, 275. Clerbaux is the only missionary of this group whose name appears in the literature.

[62] *Ibid.*, VI, 330.

century the references have been mostly to Swedish and Belgian workers. As early as 1926 the Inland Mission had a missionary in Tihua (Urumchi), but his name is missing. The Reverend G. W. Hunter spent some twenty-five years travelling in the province and "knows it better than any other living person".[63]

In 1931 missionaries Hunter, who had spent 30 years at Urumchi, and Percy Mather returned from a trip to the Kazakhs of the Ili area, and H. French Ridley of the Inland Mission undertook a missionary survey of Sin-kiang and the distribution of Christian reading matter. He started from his station in Lan-chow and took the more difficult approach by going south of the Takla Makan. Leaving November 16, he found a cart road open to Charklik, where the Chinese maintained a garrison. He noted the size of the towns and garrisons. He suffered the inconvenience of a *buran* near Lob Nor.

Leaving Charklik December 9, he covered ground already familiar from Stein's travels and made general comments about each village. New Year's Day, 1932, he reached Keriya, continued to Khotan, Yarkand, and Kashgar, and he visited the Swedish missionaries. He went on to Maral-bashi, Ak-su, Kucha, Karashahr, and then to Urumchi. On October 22 he left Urumchi for a return to his post.[64] Mather later died in Urumchi.[65] He had prepared an English-Mongol Dictionary during his service in China.

In 1932–1933 Sven Hedin returned to China to try to continue his earlier expedition, this time with the help of the automobile. The Nanking Government, still hoping to establish better communication and control in Sin-kiang, revived the arrangement with him and his party to survey the Old Silk Road and determine the possibility of opening a motor road along that path. Hedin set out in the fall of 1933 from Pe-king about the time of the height of the Moslem uprising. His party also faced the rising Chinese concern about the loss of archaeological objects. One organization, the Chinese Society for the Preservation of Cultural Objects, raised objections and appealed to the government. An agreement was finally worked out by which the expedition agreed to accept a group of Chinese scholars in the expedition at the latter's expense.[66] The members of the reconstituted expedition therefore were

[63] H. French Ridley, "Through Unevangelized Chinese Turkestan," 148.
[64] *Ibid.*, 145–148.
[65] Cable, "The Bazaars of Tangut," 29.
[66] "Chinese Outcry against Scientific Spoliation," in *Literary Digest*, 103 (November 2, 1929), 30.

David Hummel, Folke Bergman, Georg Söderbom. Karl Efraim Hill, Chinese scholars Parker C. Chen, Irving C. Yung (?), and C. C. Kung. They took two Mongol drivers.

The expedition passed through Inner Mongolia and the Black Gobi to Hami and on to Turfan, that is, along the Sin-sui Highway, as the Chinese then called it. Although they had planned to go on to Kashgar, the turmoil of the retreating Dungans between Turfan and Kashgar caused them to give up that idea. They then turned south to Korla and did some more exploring; but when they ran out of gasoline and had to visit Urumchi to get more, they were detained, arrested, and mistreated by General Ma's troops for months and only in 1934 were released and allowed to return via An-Hsi, Kan-su, and Shen-si to Sian. Thus had political dangers replaced the natural dangers of travelling a generation before.[67]

When Hedin visited Urumchi later, and addressed the Soviet Officers' Club, it was his impression that the Russian Consul General Apresoff, was more powerful in Sin-kiang than Governor Sheng.[68] Thus if Sin-kiang was China's open Back Door, then the Russians were certainly enjoying kitchen privileges!

In 1934 an "internal Security" unit corresponding to the NKVD, called the Pao-an-chu, or "Security Preservation Bureau", was established in Urumchi. One division of the unit, the Pao-an-twei or "Security Police" was under the control of Pogodin.[69]

In 1935 Aitchen K. Wu was assigned a government post in Urumchi and arrived after the flight of General Ma. He represented the new generation of educated officials with western training. His writings in later years showed a careful observation of the conditions surrounding him and an accurate reporting. His observations primarily involved the rapidly evolving transportation system. By his time there were motor roads from Urumchi to Kuldja, roads under construction from Urumchi to Chuguchak, and on the streets of Urumchi many Ford cars and others of Russian makes were seen.[70]

[67] *GJ*, 93 (1939), 164–165; Hedin, "Captured in Sinkiang"; *idem*, "A Road to Sinkiang," reprinted from the *London Times* in *Living Age*, 348 (1935), 344–347; Conolly, "The Industrialization of Asia," footnote 9.
[68] Hedin, *The Silk Road*, 166.
[69] Tien-Fong Cheng, *A History of Sino-Chinese Relations*, 177. Burton ("Tug of War in Central Asia," 519) refers to an Italian, Dr. P. Orlandini, who travelled in Sinkiang in 1934. I have no other information about him.
[70] Wu, "Will China Save Its Far West?"

In 1935 a professional writer, Peter Fleming, accompanied a Swiss newspaper correspondent M. Ella Maillart[71] in an endeavor to cross the area in search of news stories. They started from Lan-chow and moved west to Koko-nor and the Tsaidam. Before World War I the trip west from Pe-king to Kashgar by the southern route was extremely difficult, and as we have seen, few persons ever made it without elaborate preparations. By 1933, however, it had become common, and the whole center of activity had shifted to the east. Fleming and Maillart were accompanied by a White Russian couple, Stephan Ivanovich Smigonov and his wife Nina, who had made a living for several years by trading in the Tsaidam but had been forced out in 1933 by the Moslem rebellion.

This group left Pe-king February 15, 1935 by rail for Cheng-chow and continued by third-class rail to Tun-hwang and Sian. They then rode a truck to Lanchow and Si-ning, where they were delayed by passport troubles but finally were allowed to continue to Kumbun. March 28, 1935 they reached the China Inland Mission house at Tangar. Then with a Moslem caravan they continued to the lamasery of Tungkussu. They continued along the Koko-nor to Dzunchia, where they picked up a fifth member, Russian Borodishin. When they reached Sin-kiang proper, however, the latter left them with the excuse that in view of the Soviet influence in Sin-kiang White Russians had a poor survival value there. The caravan then continued southwest to Cherchen, where they were arrested but soon were released on the word of the English representative – a very different situation from the older days! Then even Cherchen had an English Sub-Consul. The party then continued to Keriya and Khotan, where they visited the Dungan General Ma Ho-san and were impressed by the Soviet advisers and the soldiers singing communist songs.

July 17 they reached Yarkand and later Kashgar. Then, on August 8 they started south to India. They returned with much news material and political information, little of geographical value.[72]

In 1935 Edward Murray spent several winter months in Kuldja on a leave of absence from Robert College in Istanbul. In the spring he moved south to seek the Tekes Valley to study the nomads of this area. He spent much of the summer visiting with the tribes, particularly

[71] She had earlier made a start in the Turkestan but did not get permission to cross the border into Sin-kiang — Ella Maillart, *Turkestan Solo.*

[72] Maillart, "Dictature doungane: réarmement à Khotan"; Fleming, *A Forgotten Journey.*

the Kirghiz chief Sayjan Beg. His return led via Tashkent and Samarkand.[73]

In 1934 the scattered uprisings in southern Sin-kiang reached Kashgar, and rebels attacked the British Consulate. Several members of the staff were killed, and a Mrs. Thomason Glover was shot in the lung while Colonel Glover was trying to make peace with the rebels.[74] Then Sir Erich Teichman in 1935 was sent from the British Embassy in Nan-king to investigate. He set out by automobile. Roy C. Andrews in Mongolia and Sven Hedin in Kan-su and Sin-kiang had already done some exploring work in automobiles, the Haardt-Citroën Expedition had popularized the idea, and some China Inland Missionaries had already gone to Urumchi by car. Teichman set out in a Ford V-8 truck with all his equipment, including a load of gasoline, for the next supply was in Hami, where the Russians had a gasoline depot. He followed the old caravan and cart road. He had the good fortune to take on as drivers two men who had earlier travelled and driven for Hedin.

They started from Sui-Yuan in September, 1935 and went northwest into the Gobi. They endured a great variety of motor trouble and road trouble but went on via Etsin Gol to Hami and then to Urumchi. From Urumchi to Kashgar they followed the cart road for the whole 950 miles. Since Sir Eric was a diplomat rather than a geographer, he added little to our knowledge of geography except road information. He did keep a sketch map as he travelled, but it added nothing new.[75] After 1935 with the increase of motor travel there was less time for observation than in the days of the camel caravan.

The mission failed to establish formally the nature of the attack on the British, and in view of the next developments must be considered a failure.

Another observer in the British Consulate in Kashgar, Mr. H. Barlow, reported Soviet influence in the changing political attitudes but also placed some of the blame on the Chinese treatment of the Sin-kiang population.[76]

In 1936 an organization called the "Anti-Imperialist League" was formed, chiefly aimed at Britain and Japan. On New Year's Eve, in

[73] Murray, "With the Nomads of Central Asia. Sojourn in the Tekes Valley."

[74] Davidson, *Turkestan Alive*, 111.

[75] Teichman, "The Motor Route from Peking to Kashgar"; *idem*, *Journey to Turkestan*; Tien-Fong Cheng, *A History of Sino-Russian Relations*, 175.

[76] Tien-Fong Cheng, *A History of Sino-Chinese Relations*, 176.

1937 demonstrations were staged in all the large cities. In October, 1938 an All-Sinkiang Congress was held in Urumchi.

In 1937 three members of the Chinese Communist Party stopped in Urumchi on their way to Moscow: Chen Shao-Yu, Kang Sheng, and Tang Fa.[77]

Dr. Wilhelm Filchner, not satisfied with the results of his magnetic work in the 20's and undaunted by the hardships and disappointment he met with then, tried again in 1937. Passing via India, he checked instruments and data with the Survey of India in Dehra Dun and went on to China, where he started his new expedition on magnetic observations. For companions he found Brother Gervasius, a German missionary, and a Russian ex-cavalry officer Borodijn (who had been with Fleming?), who soon left them, and a caravan of unruly drivers. The route led with minor crises along the Silk Road to Cherchen, but then real trouble developed. They reached Khotan, which was then under the command of the war-lord General Ma Hushan (Ho-san); and he ordered them all to return the way they had come. This was impossible, and the war-lord detained them in great discomfort for months. The British Consul General from Kashgar, Major Packman, visited them and tried to obtain their release but had to leave before he could effect it. Finally after seven months the party was released and allowed to continue. They had caravan trouble next, and not until they reached Leh did they find any peace. On arrival in Leh, Filchner was notified that he had been awarded a national prize. Immediately on his arrival in India, however, Filchner went to the Survey of India offices and checked his data. The scientific results of his measurements were significant contributions to geo-magnetic studies.[78]

In 1939 H. H. Johnson, on his way to his post as British consul in Kashgar found that passable motor roads led all the way from the Pamirs to the Tadjik SSR, and he entered Kashgar from that direction.[79]

As the war clouds gathered in Europe in 1939, the Sino-Japanese struggle continued unabated, and the national government continued its program of reform in the area that it still controlled. The first 3-year Reconstruction Plan for Sin-kiang ended in 1939, and the second began with an ambitious program to increase the number of schools and radio stations, set up a broadcasting station, eight telegraph offices,

[77] *Ibid.*
[78] *GJ*, 95 (1940), 461–462.
[79] "Caravan into Sinkiang," 136.

and many new telegraph and telephone facilities.[80] At the same time an improved road opened from the Soviet Union railhead at Sergiopol to Urumchi, east to Hami, and then on to Lan-chow and Cheng-tu, some 2,000 miles. This road had existed for centuries and only needed improvement to become an automobile road. In 1939 the road carried some 20,000 tons. In 1939 the caravan road from Osh to Kashgar was improved and made passable for automobiles. From Kashgar another improved road led on to Hami over the north route. Still another road from Stalinbad followed an old caravan route over the Terek Pass.[81]

With communication with Russia open and relatively easy, with only a trickle of imports coming through North India, and with tenuous supply routes to the littoral, Sin-kiang was actually in better shape than Central China, which could barely maintain itself. The latter's only other route of supply was the Burma Road, which the British had closed early in 1940 on Japanese insistance. In October they reopened it, but its capacity was very limited and damage to it easy.[82] On the other hand for the next two years the Russians sent large quantities of goods across Sin-kiang, Kan-su, and Lan-chow for shipment to Chungking. Disregarding tradition, they abandoned the ancient "Silk Route" for the prosaic name of "Northwest Highway".[83]

In August, 1937, after the opening of hostilities between China and Japan, China and the USSR signed a non-aggression pact, and Russia delivered a large quantity of aid goods. The treaty was strengthened by a new one on June 16, 1939. Then, with free access to Sin-kiang, in November, 1940 two "Representatives of the USSR" Bakulin and Karpav, went (flew?) to Sin-kiang and made a series of demands on Governor Sheng, one of them a monopoly of tin "and ancilliary minerals" mining in the province. Sheng was then under severe pressure. He had collaborated steadily with the USSR for eight years, had become a member of the USSR Communist Party, and resistance would have meant breaking established habit. He was ill. On the border of Mongolia a rebellion had started in which he suspected USSR machinations. He signed.[84]

[80] C. Y. W. Meng, "Sinkiang – China's Back Door"; Chen Chung Wu, "The Reconstruction of Sinkiang in 1940"; "Chinese Turkestan Makes Progress."
[81] Rudolph, "Strategic Roads," 121–123.
[82] *Newsweek*, 16 (December 23, 1940), 23–24.
[83] R. H. Pinder-Wilson in *JRCAS*, 41 (1954), 168 (Review of Vincent, *The Sacred Oasis*).
[84] Li Chang, "The Soviet Grip on Sinkiang," 498; Wu, *China and Soviet Russia*, 260–261.

By 1939 few British interests were left. Then in March all foreign merchants in southern Sin-kiang were ordered out of the country on short notice. When the British Consul at Kashgar protested, his couriers were molested. Thirty-three British and Indian business men and their families finally showed up in Gilgit after a severe crossing. Protests to the capital at Urumchi were unavailing. This evacuation for all practical purposes brought the final ouster of the British from the territory so many brave men had suffered hardship and even death to open to western influences.[85]

Again, at the beginning of World War II the Russians sent motorized troops to Hami, where they stayed until about 1943, then withdrew. No names are available, but the strategy seems clear. The Russians could have separated Sin-kiang from the weak Chinese government but chose not to. Evidently they had other plans. At the same time the unit in Hami was a safeguard against further Japanese advance into the interior of China.[86]

Eric Shipton served as British Consul in Kashgar 1940–1942. His route of access in 1940 was via Hunza and the Mintaka Pass into the Kashgar area. Unlike his predecessor Skrine, Shipton's whole tour of duty faced restrictions on travel within his consular district. At the end of the tour he found it advisable to return to India by way of Russian Turkestan and Iran.[87]

The close co-operation between General Sheng and Soviet representatives continued until 1942. Then the general and his advisors seemed to feel that the chances of a German victory did not make continued association with the Soviets advisable. At the same time the Soviets made demands for a new treaty which would give them a virtual monopoly on Sinkiang oil.[88] Sheng therefore dismissed his Russian advisers and requested that they cease operations and clear out. They complied.[89] Thus the General shifted his allegiance from the Soviets

[85] Tien-Fong Cheng, *A History of Sino-Russian Relations*, 175.
[86] *Newsweek*, 16 (December 23, 1940), 23–24.
[87] Shipton, *Mountains of Tartary*.
[88] Lattimore, "Sinkiang's Place in the Future of China." Oil had long been known in Sinkiang. There were some surface seepages in the Tian Shan area. In 1908 a well was drilled and oil found at a depth of some 35 feet. A small industry grew up during the next decade, dwindled away by 1920, but was revived in the 30's. During World War II refineries produced quite a bit of oil products – Joseph Needham, "Science and Technology in the Northwest of China," *Nature*, 153 (February 26, 1944), 241. Since then development has greatly increased.
[89] "The True Story of Sinkiang"; Rand, "The No Man's Land of Asia," 98–100;

to the Kuomintang. Late in 1942 to confirm the establishment of Kuomintang in the province, a government mission flew to Urumchi for conferences. These were Madame Chiang Kai-Shek and Generals Chu Shao-liang, Mao Peng-Shu, Ho Ching-Wu, Liang Han-Tsao, and Chaucer H. Wu, with Dr. Wong Wen-Hao. They apparently did not travel extensively outside the capital city.[90] At the same time that the Russians withdrew, the Americans and British at last got permission to set up consulates in Urumchi.[91]

In October, 1943 *Life-Time Magazines* received permission to send a small expedition of two men to Sin-kiang. The two were Correspondent Theodore H. White and Photographer William Vandivert. The pair visited the northern area, Urumchi, Kashgar, the Ili Valley, Ak-su, Kucha, Korla, Yenchi. They brought back some excellent photographs, but the published text should be read with great caution. They arrived in time to observe the last of the withdrawal of Russian soldiers and civilians and then studied some of the economic conditions of the province.[92]

Shortly after the Russian withdrawal, late in 1943, the economic depression that followed showed the power of Soviet aid, and the military situation changed so that an eventual Axis defeat seemed assured. The Sin-kiang government saw the result of the hasty decision of the year before and tried to make friends again. Their efforts came a bit late. The Russians did not take the ouster in 1943 quietly. Soon after their withdrawal a series of rebellions broke out. In February, 1944 the nomadic Kazakhs of the Altai area, led by Chief Osman broke out on the Outer Mongolia border. Soviet planes from Outer Mongolia crossed to Sin-kiang and bombed Chinese forces while ground forces, allegedly led by "Soviet officers" "wiped out" three Chinese regiments. The invasion did not spread at that time.[93]

Time Magazine, 45 (May 28, 1945), 39–40. Russian troops pulled out of Hami and the Pamir border. The advisers left; technicians stripped the oil fields and mines of their equipment and carried it away. The Sov-sin-torg was dissolved – Wei, *China and Soviet Russia*, 156–159.
[90] "The True Story of Sinkiang."
[91] McLain, "The New Dominion," 132. The new consuls were Horace Smith and W. Graham – Wu, *op. cit.*, 262.
[92] "Heart of Asia"; "Sinkiang – Land of the Back of Nowhere"; *Time Magazine*, 43 (April 17, 1944), 15, (October 25, 1943), 27–28.
[93] Li Chang, "The Soviet Grip on Sinkiang," 500–501; "The Kazakh Rebellion in Sinkiang"; *China Handbook 1951*, 386–388. For the other point of view, cf. "There seems little reason to doubt that the difficulties in the early spring on the Sinkiang-Outer Mongolia border were caused by Chinese attempts to resettle

At the same time a smouldering "freedom" or secessionist movement in the Ili Valley became active. To keep the movement from bursting into full rebellion, the Governor accepted the leader of the movement as Vice-Governor; but he did not last long, and the effort at appeasement did not succeed. The seccessionist movement continued until 1944 when the Moslems in the Ili Valley set up a separate state called the East Turkestan Republic. This "Republic" gradually gave up the use of a separate flag, but its government continued virtually independent of Sin-kiang until 1949 when Communist control reached the whole province. They then merged again.[94] Referring to the Russian support of the movement, Chief Osman later reported the arrival of "Ili" troops in Ch'eng-hua, the capital of Altai: "They wore Russian uniforms and spoke Russian. . . . The troops were commanded by a Lieutenant General Birkdorff, and under him were two regimental commanders called Liesskin and Dostgoroff. . . . A Russian police chief called Sembayeff come with the Ili troops. The Ili people also took over 28,600 ounces of gold from the Aghan Gold Mining Bureau. . . . The Russians are now in charge of the gold and wolfram mines in Altai and are increasing production daily."[95] One of the leaders of the Ili revolt was Farkhad, an Uzbek, who brought arms for the rebels.[96]

In 1944 also an investigation of the USSR mining monopoly showed that in the last two years before the break in 1943 one hundred fifty tons of tungsten, an "ancilliary mineral," had been sent to the USSR. "More than 60 engineers and technicians, together with 3,000 drafted miners, were engaged in this work, under cover of 'geological surveys.'"[97] No names are available, but the geological survey made must be of great potential value to the study of the province.

Kazak Nomads who fled into Outer-Mongolia [and] were followed by Chinese troops who were driven back by Mongols. The Soviet minister in Outer Mongolia stated that Mongolian planes bombed points in Sinkiang in retaliation for Chinese bombings in Outer Mongolia." – H. A. Wallace to F. D. Roosevelt, July 10, 1944 in *Department of State Bulletin* No. 640, 25 (October 1, 1951), 543–545.

[94] Rand, "The No Man's Land of Asia"; *U.S. News and World Report*, 28 (January 27, 1950), 22–24; Li Chang, "The Soviet Grip on Sinkiang," 501; Lattimore, *Pivot of Asia*, 86–87.

[95] Whiting, "Nationality Tensions in Sinkiang," 9.

[96] Ian Morrison, "Some Notes on the Kazaks of Sinkiang"; *Time Magazine*, 74 (December 28, 1959), 22; Tien-Fong Cheng, *A History of Sino-Russian Relations*, 281.

[97] Li Chang, "The Soviet Grip on Sinkiang," 500. "During Sheng's rule hundreds of Soviet scientists and technicians explored the province" – Robertson, dispatch, in *New York Times*, February 1, 1948, p. 33.

Henry A. Wallace, flying across the USSR, on his way to Kunming, stopped briefly in Urumchi in July, 1944. He apparently did not leave the city, and his background made him necessarily dependent on briefing for his impressions of Sin-kiang. Owen Lattimore accompanied him.[98]

In the midst of these multiplying incidents with which Governor Sheng was unable to cope, he was recalled to Chung-king.[99] The change did not help. In the fall of 1945 invading forces, allegedly from Soviet Tajikstan, crossed the border three times into southwest Sin-kiang, captured Kaghlik, surrounded Yarkand, and threatened Kashgar. After a short campaign they withdrew.[100]

In the summer of 1945 a new British consul to Kashgar was appointed, Etherington-Smith. Major N. L. D. McLean accompanied him to his post. They passed from Gilgit over the Karakoram to the Chinese frontier. A border guard patrol conducted them to Tashkurgan, where they were welcomed. In the spring of 1946 the new consul accompanied the outgoing Michael Gillet to Urumchi to visit the new Governor Chang Che-Chung.[101]

Territorial loss was only the beginning. With the end of the war in 1945 and the establishment of a coalition government by the Kuomintang, Soviet influence again became powerful enough to persuade Generalissimo Chiang Kai-Shek to deny the United States the use of airbases in Sin-kiang or the privilege of commercial planes. Russian planes served the area.[102]

The Soviet consulates became very active at this time with a program of cinema shows, book stores, and extensive propaganda programs in the political field. Heavily-staffed consulates were maintained in five cities.

In 1946 Eric Shipton was reappointed to the consulate in Kashgar.

[98] Wallace to Roosevelt, July 10, 1944, in *Department of State Bulletin* 640, 25 (October 1, 1951), 543; Wallace, *Soviet Asia Mission*, 152–161. By this time and until 1949, besides one Russian air line Alma-Ata to Hami, there were two Chinese air lines with American pilots who flew to Urumchi. However, by a treaty of September 9, 1939, the USSR had a monopoly on provincial air transport, and British and U.S. planes were discouraged – Walter Sullivan, dispatch, April 1, 1949 in *New York Times*, 98 (April 6, 1949), 119.

[99] Li Chang, "The Soviet Grip on Sinkiang," 500.

[100] McLean, "The New Dominion," 133–135; E. Shipton, *Mountains of Tartary*. 52–55; D. Shipton, *Antique Land*, 129.

[101] McLean, "The New Dominion," 134, 137.

[102] McLean, "The New Dominion," 138; *U.S. News and World Report*, 28 (January 27, 1950), 22–24.

This time he crossed via Karakoram Pass against the threat of Sarikol bandits who took advantage of the insecure rule by the national government. This time he enjoyed more freedom of movement, and he was able to spend part of his time exploring in the mountains north of Kashgar, the Tushuk Tagh, the Mustagh Ata, the Uch-Tash, and the Chakragil areas. In the fall of 1948 he returned to India through the Hunza passage.[103]

In June, 1947 after Masud Sabri had become the new Governor, Sin-kiang was again invaded by forces from Outer Mongolia. At this time, however, Chief Osman turned on his old allies and began to support the Kuomintang; but after the Battle of Peitashan, Osman's forces were scattered.[104] As soon as the pro-Soviet forces had occupied the Chuguchak area, the "Soviets" re-entered and resumed oil-drilling operations. A "Russian Tartar" was made director. "More than 1,000 Soviet technicians, 3,000 workers and 120 armed guards were employed in the districts of Fu-yun and Cheng-hua, bordering Outer Mongolia."[105] Soviet consuls acted as go-betweens for negotiations between Governor Sabri and the Ili secessionists.

During all this time the Central Government carried on its own educational work as best it could. C. Chang, of whom no other information is available, apparently did geographical field work about this time on land utilization in the villages of Yavah near Kargalik.[106]

An American consulate was opened in Urumchi (Tihwa) in 1943. The fourth consul was J. Hall Paxton, who lived there with his wife Vincoe Charity (née Mashrush), an ex-missionary and Army nurse. He took office November, 1946, relieving Consul Robert Ward. He later had the help of two vice-consuls. Consul Paxton travelled widely in local towns, showing movies, giving English-language lessons, and carrying on a broadcasting program. At the same time Mrs. Paxton conducted a small clinic.

In August, 1949 with the rapid advance of communist forces, the Consul received orders to leave. However, the road to the coast, through Kan-su, was closed by the advancing troops. He decided to evacuate his family and retainers through India. He organized a party to include

[103] E. Shipton, *Mountains of Tartary*; D. Shipton, *Antique Land*.
[104] *Newsweek*, 29 (June 23, 1947), 35; Li Chang, "The Soviet Grip on Sinkiang," 502; Morrison, "Some Notes on the Kazaks of Sinkiang," 70–71.
[105] Li Chang, "The Soviet Grip on Sinkiang"; Robertson, dispatch in New York Times, February 1, 1948, p. 33.
[106] C. Chang, "Land Utilization and Settlement Possibilities."

Accountant Enver Shakol, his sister Fatima, movie projectionist Dimitri Yugoff, Czech driver Erwin Konetschney, and Vice-consul Robert D. Dreesen. Leaving in a truck, they stopped at Ak-su for motor repairs obligingly furnished by the Nationalist Army garrison, commanded by General Li Chu-Tang. It took two weeks in Kashgar to clear formalities to continue. To console themselves, they studied K. P. S. Menon's Book, *New Delhi to Chungking*. In Kashgar they hired a caravan led by Sali Haji. Then they were further delayed by a mutiny of General Chao Hsi-Kwang's troops in Yarkand. At Kashgar they picked up Colonel Davud and the three children of ex-Governor Masud Sabri, who feared reprisals for his earlier friendliness toward the United States. The party was briefly stopped at Yarkand by the mutinous soldiers.

At Pusar they sent their truck back to the Indian Consulate in Kashgar, then continued by caravan. They crossed the Tiznof River 24 times. Six weeks after leaving Urumchi they reached Kokat, the Chinese outpost. After a distressing delay, they were allowed to proceed. On October 6 they reached Karakoram Pass and continued to Sasser Pass, Panamik, Khardong Pass, and thence on to Leh.[107]

In the summer of 1948 Franc and Jean Shor took advantage of one of the last chances to visit Sin-kiang as tourists. They flew from Shanghai to Urumchi with the intention of returning by land and visiting the Caves of the Thousand Buddhas. In Urumchi they met U.S. Consul Paxton and U.S. Military Attaché Robert Ekvall. After visiting Lake Tien Chih (Heavenly Lake) in the Tien Shan, they noted the presence and residence of many White Russians (White Guardists, we suppose) in the capital. September 29 they began the return trip by truck and reached Turfan at dusk, 125 miles. The second day they reached Chi-Chueh Chuan (Seven-cornered Well) and the third day reached Hami, where they could still see signs of the fighting of 1937. Leaving Hami, they travelled 50 miles to Lo-to-Chan (Camel Station), thence by truck to Tun-hwang. They found that unfortunately restoration of the paintings was being done in bright colors. After taking some excellent color photos of the art work, they continued to An-si, Yemen, and Lan-Chow, thence by plane to Shanghai.[108]

The care with which the old priests had guarded the cave temples at Tun-Hwang did not last. In 1924 when Langdon Warner visited them, he found the place deserted and open to curio seekers. In 1942 the Kuomintang founded an institute to care for the relics, under the

[107] Paxton, "How I Escaped over the Roof of the World."
[108] Shor, "The Caves of the Thousand Buddhas."

directorship of Chang Ta-chi'en. Present director is apparently still Chang Su-hung, and the work of preserving the area continues.[109] Until 1950 the caves were still open to visitors.

In this same summer of 1948 the Cave of the Thousand Buddhas was again visited by Irene Vongehr Vincent. Alone, she flew in six hours from Pe-king to Lan-chow. She caught a ride on a truck of the Government Oil Company and spent the first night at a caravanserai. On the 7th day of travel, they reached Chiu-Ch'uan and after a delay, took five more days to reach Tun-Hwang, on the edge of Sin-kiang. After studying the caves and making new color photos, she returned by hitch-hiking on passing trucks. It took less than seven days to reach Lan-chow again.[110]

Early in 1948 an Australian journalist, Frank Robertson, visited Urumchi in search of material for a "book." Early in 1949 another journalist, Walter Sullivan, also visited the capital. Their dispatches indicate primarily attention devoted to political aspects of the area.[111]

With the withdrawal of Kuomintang troops and the advance of Communist forces, Sin-kiang, like the rest of mainland China, was occupied by 1950. The occupation was a calm operation compared with some of Turkestan's stormy past. In 1949 the Kuomintang General T'so Shih-Yueh (Tso Chih-Yueh) who had recently replaced General Sung Hsi-Lien, broadcast an appeal for pacific change. The troops called "People's Liberation Army" marched in to join a local band of rebels. Most old officials "stayed" on their jobs, and T'so himself became second-in-command of the province. September 25–26, 1949 the leaders formally severed ties with the Kuomintang and joined the Communists. The unruly Uighurs, under their leader Yulbaz, at first protested but soon accepted the new regime.[112] With a new regime in power, the Vice Chairman of the Sin-kiang Provincial Government, Seyfuddin, went to Moscow in January, 1950 and on March 27 signed agreements setting up two Sino-Soviet joint stock companies, one for

[109] Basil Gray, "The Cave Temples," in *Atlantic*, 204 (December, 1959), 100–102. The Central Press Agency during the War maintained a photographic team at the caves to record the frescoes for the future – Joseph Needham, "Science and Technology in Northwest China," in *Nature*, 153 (February 26, 1944), 241.

[110] Vincent, *The Sacred Oasis*.

[111] Robertson, dispatch, *New York Times*, February 1, 1948, page 33; *idem* in *Christian Science Monitor*, June 6, 1949*; Walter Sullivan, dispatches in *New York Times*, March 30, 1949*, April 6, 1949, p. 19, and April 18, 1949.*

[112] Davidson, "In Chinese Turkestan"; Sullivan, dispatch in *New York Times*, March 30, 1949, p. 21.

oil, one for other metallic minerals.[113] This treaty allegedly gives the USSR full control of uranium-bearing areas and allows construction of a railway linking Sin-kiang with the Turk-Siberian Railway.[114]

Despite the evacuation of Western representatives, at least one geographer attempted the opposite direction. Major H. W. Tilman, on a mission to study the Bogdo Ola Mountains and Chakra Agil, flew to Shanghai, thence to Lan-chow, continued by bus to Urumchi, and went on to his destination. On his way back, he went south to Kashgar. From there, seeking an untrodden route to India, he passed Taghdumbash and crossed the Chinese border at Min-taka Karaul. Thence his route led across part of Afghanistan and on to Chitral.[115]

Evidently a number of Russian advisers and technicians again entered the area, although their names are not available. The development of nuclear energy in that decade brought Sin-kiang into prominence in the plans of the Soviets, who had already carefully mapped Sin-kiang's mineral resources. As early as 1949 they began an energetic exploitation of the uranium deposits in the Tien Shan Mountains.[116]

It is clear that in subsequent years a large number of Soviet representatives entered Sin-kiang, some of them scientists, for geographical, geological, or transportation studies. March 27, 1950 two joint-stock companies for oil and mineral exploitation were set up. April 2, 1950 a Soviet-Chinese airline was established to fly from Pe-king to Urumchi, then to Alma Ata, operated by Soviet personnel. September 1, 1953 another line opened to connect Kashgar with Urumchi. In October, 1953 Sin-kiang celebrated the third anniversary of the establishment of the Sino-Soviet oil company and admitted the help of Soviet experts. Oil development was under the direction of Soviet oil experts from Baku. October 12, 1954 the joint-stock companies were terminated, and presumably most Soviet experts left. In May, 1953 a Soviet Locust Extermination Mission entered Sin-kiang, and another in May, 1954, with seventeen planes. Forty-five specialists remained to prepare for the 1955 work. In 1955 eight planes were used for spraying.

[113] Li Chang, "The Soviet Grip on Sinkiang," 503.

[114] *Ibid.*, 503; Wei, *China and the Soviet Union*, 232–233.

[115] H. W. T. in *JRCAS*, 39 (1959), 82–83 (review of Tilman, *China to Chitral*); Tilman, "Wakhan: or How to Vary a Route."

[116] *Newsweek*, 46 (September 26, 1955), 54–55; *U.S. News and World Report*, 28 (January 27, 1950), 22–24; Amar Lahiri, "Communist New Deal in Sinkiang," in *United Asia*, 3 (December 3, 1950), 143* quoted in Fedyshyn, "Soviet Retreat in Sinkiang?", 129.

During the 40's the Kuomintang had tried to extend a railroad to Lan-chow. October 1, 1952 the new regime announced the opening of construction on the stretch Lan-chow to Sin-kiang. February, 1954 public announcements said that it would be extended to Urumchi, and then to Soviet territory. October 12, 1954 the terminus was announced as Alma Ata, and Soviet technical assistance was admitted.[117]

On the basis of this technical help we begin again to see evidence of the relatively high order of Russian engineering skill and reporting. From Lanchow the road was laid out to lead to An-si by a route between the Ala-Shan and Nan-Shan ranges in what one writer called the Kan-su Corridor. It continued to Hami by curving southwest to flank the Bei-Shan. From Hami to Turfan it followed the south edge of the Bogdo-Ula and Karlik-Tagh. From Turfan to Urumchi it followed the automobile and old caravan route, then went north to the lowlands at Wu-su, Shi-kho, and the Ebi-Nor. Then it continued to join the Turk-Siberian railway line to Alma Ata.[118]

The increased trade with the Soviet Union was evidently carried out via three commercial corporations, the In-torg, Vostok-intorg, and Avto-nesh-trans.

In 1955 a new medical college was opened in Sin-kiang with 100 instructors from various parts of China.[119] Along with these developments came a movement to change place-names from the Chinese form into the local terms used by inhabitants, further confusing the cartographers.[120]

October 1, 1955 Sin-kiang took the new name "Sinkiang-Uighur Autonomous Region of the Chinese People's Republic".[121] Political authorities began to build airfields in the south, where both countries could use them. In 1955 the trend of political influence turned. The Pe-king government began to send teachers and propagandists to Sinkiang. Russian personnel then began to withdraw, leaving two consulates.[122]

[117] Victor P. Petrov, "New Railway Links between China and the Soviet Union," 473.

[118] Синицын, "Общий физико-географический обзор районов Ланьчжоу-Алмаатинской железной дороги," *ИВГО*, 87 (Ноябрь, 1955), 505-515.

[119] Fedyshyn, "Soviet Retreat in Sinkiang?"

[120] Whiting, "Nationality Tensions in Sinkiang," 11.

[121] Clubb, "Economic Modernization in Sinkiang."

[122] At the same time the Chinese occupied the borders to the limits of India except in Tibet and began to exert pressure on India's boundaries – Kusum Nair, "Where India, China and Russia Meet," 332, 337.

Early in 1955 a group of British correspondents of Reuters News Agency and of the *Manchester Guardian* visited Sin-kiang.[123]

In 1955 and 1956 journalist Basil Davidson made an extensive tour of the area. Flying from London via Vilnius, Moscow, Omsk, Ust' Urda and Irkutsk, and Pe-king, and after some delay there, back to Sian, Lan-chow, Sa'-chow, he entered the area during the flight that took him to Hami and then to Urumchi. This last jump, which meant such exertion to the travellers of forty years before, took some three hours.

In Urumchi Davidson was impressed by the signs of construction, improved communication, education, and by social changes. With a guide, Niadze, he visited the ruined temples and caves at Kara-Khoja, Turfan, and the other cities in the area so famous from the archaeological work of the first part of the century. His travels to Kashgar and Yarkand by air offered no problems. His visits to various ethnic groups were under sponsored supervision, and his reactions were of a journalistic nature. The result of his interviews drew bits of recent history from many people. The message of the interviewees seems to speak out clearly on two subjects: The people of Sin-kiang resented most the taxation by the nationalist government and the abuse of Chinese nationalist, that is, foreign, soldiers. Their stories seemed to be a standard plea for a de-centralized government.[124]

Davidson's travels and interviews with persons of all levels brought out the names of other visitors from the outside but of whom I have no other data and must rely on his report.[125]

In 1947 a chieftain Uzman was a refugee in the hills near Urumchi and was found by Ian Morrison and "Two American companions".

During the late war, U.S. Marine Sergeant Douglas MacKiernan was in charge of a weather station at Sa'-chow. In 1949 he was vice-consul at Urumchi. With the collapse of the Kuomintang government he left toward Tibet and was murdered in Tibet.

In 1949 the British Consul in Urumchi, a former missionary Fox Holmes, was arrested and expelled.

In 1949 Dr. Joseph Needham was in Tun-hwang studying the murals of the Caves of the Thousand Buddhas.

In 1956 Davidson enjoyed briefly the company in Urumchi of a group of touring Pakistani journalists, but he gives no names.

[123] Davidson, *Turkestan Alive*.

[124] *Ibid.*, 121–122, 129, 130, 146, 168.

[125] *Ibid.*, 134, 137, 202.

American Dr. George Hatem or Ma Hai-tech, had long ago joined the Mao-Tse-Tung forces and was in 1956 living in Urumchi. Davidson visited him at his medical work among the Kazakhs.

While the present regime in Sin-kiang plans for a re-arrangement of the land-tenure system and for settlement of Chinese from the East in the desert land, interesting changes in the geographical structure of the area are in store, possibly shifting of the flow of the Ili, Emil, and Black Rivers.[126] These studies, with development of the oil and mineral resources mean intensive geographic work on the ground, which we hope will be made freely available to geographers at large.

[126] Clubb, "Economic Modernization in Sinkiang."

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This bibliography proposes to give more information about the books and articles actually mentioned in this work. It falls far short of covering the field – the total bibliography gathered for this study consists of 577 books and pamphlets and 1,278 articles in periodicals, all exclusive of many political, linguistic, and artistic articles and of newspaper articles.

ABBREVIATIONS OF PERIODICAL TITLES

AG *Annales de Géographie*, Paris (Armand Colin), Volumes 1–5 straddle two years each, 1891–1896. One volume per year since Volume 6 (1897).

AGB *Annales de Géographie, Bibliographie de l'année 1891* –. Also called *Bibliographie géographique annuelle*, Vols. 25–41 are called *Bibliographie géographique*. After Volume 41 was called *Bibliographie géographique internationale*. Paris (Colin) 1894 –.

BEFEO *Bulletin de l'École française d'Extrême Orient*, Hanoi, 1 (1901) –.

BGI *Bibliographie géographique internationale*. Annual. Association de géographique français. Paris (Librairie Armand Colin). See *AGB*.

BSG *Bulletin de la Société de Géographie de Paris*. Series 1, 1–20 (1822–1833); Series 2, 1–20 (1834–1843); Series 3, 1–14 (1844–1850); Series 4, 1–20 (1851–1860); Series 5, 1–20 (1861–1870); Series 6, 1–20 (1871–1880); Series 7, 1–20 (1881–1899). Superseded by *La Géographie* 1 (1900) –.

Current Background Weekly issue, numbered issues. Published by the U.S. Consulate General, Hong Kong.

GJ *Geographical Journal*. London. Two volumes per year since 1893. Supersedes the *PRGSM*.

GR *Geographical Review*. American Geographical Society of New York. 1 (1916 –.

IAUGS *Izvestia of the All-Union Geographical Society, Geographical Series*, Leningrad.

IIRGS *Izvestia of the Imperial Russian Geographical Society of St. Petersburg*. One volume per year. 1 (1865) –.

JA *Journal Asiatique, recueil de mémoires et de notices rélatifs aux études orientales*. Paris. 1st Series 1–11 (1822–1827); Series 2, 1–16 (1828–1835); Series 3, 1–14 (1836–1842); Series 4, 1–20 (1843–1852); Series 5, 1–20 (1853–1862); Series 6, 1–20 (1863–1872); Series 7, 1–20 (1873–1882); Series 8, 1–20 (1883–1892); Series 9, 1–20 (1893–1902); Series 10, 1–20 (1903–1912); Series 11, 1–20 (1913–1922); Series 12, 202 (1923) –.

JRAS *Journal of the Asiatic Society of Bengal. Part 1, History and Antiq-*

uities. 1 (1832) –.

JRAS *Journal of the Royal Asiatic Society of Great Britain and Ireland.* 1–20 (1834–1863); New Series, 1–21 (1864–1889); Third Series, 1889 –. This series is cited by year only.

JRCAS *Journal of the Royal Central Asian Society.* Started as *Proceedings* (1904–1913), continued as *Journal*, 1914 –.

JRGS *Journal of the Royal Geographical Society*, London. 50 volumes (1830–1880). Title was then changed to *PRGSM.*

JVAG *Journal des voyages découvertes et navigations modernes; ou Archives géographiques et Statistiques du XIXe siècle; ouvrage periodique rédigé par une société de géographes et de voyageurs français et étrangers et publié par* T.-T. Verneur. Paris, 23 volumes, 1821–1824.

La Nature *La Nature, Revue des Sciences et de leurs applications aux arts et à l'industrie.* Paris, Volume 1 (1873) –.

Nature London. 1 (1869) –.

PM *Mitteilungen aus Justus Perthes' geographischer Anstalt über wichtige Erforschungen auf dem gesamtgebiete der Geographie von Dr. A. Petermann.* Gotha. (Commonly referred to as *Petermann's Mitteilungen*). One volume per year since 1856. Numbering of volumes began in 1869 with volume 15.

PRGS *Proceedings of the Royal Geographical Society.* 22 volumes, 1857–1878. Title was then changed to *PRGSM.*

PRGSM *Proceedings of the Royal Geographical Society and Monthly Record of Geography. New Monthly Series.* London (Edward Stanford) a total of 14 volumes, 1879–1892. Title was then changed to *GJ.*

SBAW *Sitzungsberichte, (Königlich) (preussischen) Akademie der Wissenschaften, Berlin.* Two volumes a year 1882–1919. One volume per year 1919 –. Separate title pages. Cited by year only.

Science *Science, An Illustrated Journal*, published weekly. Cambridge, Mass. Volume 1 (1883) –.

SCMP *Survey of the China Mainland Press.* Published by the U.S. Consulate General, Hong Kong.

SGM *Scottish Geographical Magazine*, Royal Scottish Geographical Society, Edinburg, 1 (1885) –.

Wiensb *Sitzungsberichte der Akademie der Wissenschaften. Philosophische-Historische Klasse.* Vienna. 1 (1848) –.

WZKM *Wiener Zeitschrift für die Kunde des Morgenlandes, Vienna.* 1 (1887) –.

Zapiski *Записки Имераторского русского Географического Общества...* под редакцией А.К. Бекетова, К.Н. Бестужева-Рюмина, 4 vols. (1861—1864.) After vol. 4 the *Zapiski* divided into three journals.

ИВГО *Известия Всесоюзного географического Общества.* Академия Наук СССР. Географическое Общество Союза ССР. Москва-Ленинград.

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Altaï [Turki] = golden,
Altyn [Mongol] = golden,
Amne = sacred,
art = dangerous gap at high elevation/pass,
bel = low, easy pass,
bogdo = lordly, majestic,
bulak = spring,
chaidam = place of trade,
chaka = salt lake,
cho = lake,
chu = river,
dasht = desert,
davan [Tatar] = difficult, rocky defile or pass,
dukha = ferry,
giachug = rest house,
gilga = gorge,
gol = stream/river [Mongolian],
göl [Turki] = lake,
gomba = monastery,
kara = black,
karaut = guard station,
khyrma = fort, enclosure,

kishlok = village,
kol [Kirghiz] = wide valley,
kuduk = well,
kul [Mongolian] = lake,
kurgan = walled town/fortress,
kutal = wood/opening between low hills,
la = pass/mountain,
nur = lake
pul = bridge,
sarig = yellow,
sarka = goldfield,
serdoba = reservoir,
tang = plain,
tati = old débris-strewn site,
thok = goldfield,
tiube = burial mound,
ula = mountain range.
ussa = river,
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